



Agriculture
Canada



New Brunswick
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Livestock Feed
Development
Subsidiary Agreement

Entente auxiliaire
sur le développement
des provendes

1987-1991

Canada

New Brunswick
Nouveau-Brunswick



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***Evaluation of the
Canada/New Brunswick Livestock Feed
Development Subsidiary Agreement
(1987-1991)***

***Prepared by
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Final Evaluation of LFDSA (1987-1991)

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Executive Summary

Focus of the Final Evaluation

The two principal objectives of the Canada/New Brunswick Livestock Feed Development Subsidiary Agreement (1987-1991), are:

- "1. To develop a competitive and expanded livestock feed sector that enhances the long-term economic viability of the livestock and poultry industry and provides a high degree of feed self-sufficiency within the Province.
2. To increase the level and stability of net returns for participants in the sector."

Through discussion with the Steering Committee, it was agreed that the focus of this final evaluation would be on:

- Providing a comprehensive analysis of the rationale for the Agreement;
- Determining the extent to which the objectives of the Agreement have been achieved;
- Identifying and measuring the outcomes and specific impacts and effects of the Agreement.

The administrative and delivery aspects of the Agreement were given less emphasis as they were dealt with in a mid-term evaluation conducted in 1989.

The evaluation framework developed at the outset of the Agreement was modified to reflect the available data and has served as the guide for conducting the evaluation. The evaluation issues are identified in this framework. The methodology was designed to address each issue.

Agreement Overview

The Agreement is comprised of four major programs with different individual thrusts, but working simultaneously toward the overall Agreement objectives. Within these programs there are several sub-programs which have their own objectives. Each of the sub-programs work simultaneously, but toward their respective major program objectives. The four major programs of the Agreement are:

- Livestock Feed Development
- Technology Enhancement
- Marketing
- Industry Support Services

The budgets for each of these programs are as follows:

Program	Total Budget
Livestock Feed Development	\$5,000,000
Technology Enhancement	3,275,000
Marketing	3,600,000
Industry Support Services	<u>1,250,000</u>
Total	\$13,125,000

The Federal and Provincial program contributions are 75% and 25% respectively.

Key Findings and Conclusions

Rationale Issues

The main conclusions relating to *Rationale Issues* are:

- Due to the Agreement, there has been an improvement in forage quality, but most of the conditions which created the need for the Agreement (high cost feed, lowered freight transport subsidies and imported grain) still apply.
- Because the grain stabilization program did not materialize as assumed, the appropriateness of the grain production program's design cannot be evaluated fairly. In any future agreement, the price stabilization component will need to be addressed.
- GATT and free trade may lead to a decline in the livestock production in the province, which could improve the level of self sufficiency, but which will highlight the need for lowering production costs.
- There were not good linkages between the objectives, the strategy, and the targets, and some targets were not defined. As a result, there has not been a clear understanding among those implementing the Agreement as to the overall strategy.
- The Agreement assumed that "the available land base and emerging cereal technology indicate that competitive feed grain production is possible." This should be reassessed in light of the fact that no new land was put into production during the Agreement.
- The strategy provided assistance to most farmers under similar terms and conditions, whereas some observers feel that targeting of benefits or programs to specific farmers or regions would have had a greater impact.

- Changes to the Agreement which opened up funding to projects excluded at the outset disrupted the long range investment plans of some producers and worked against the governments' attempts to encourage this type of planning.

Objectives Achievement Issues

The main conclusions concerning *Objectives Achievement* are:

- The Agreement has had a positive effect on the profitability and competitiveness of the livestock sector. This has resulted primarily from improved quality of forages and the direct infusion of funds from the Agreement
- Similar benefits are not evident for livestock feed producers who are not also livestock producers.
- There has been no expansion of the grain sector. In fact, during the Agreement, grain acreage has declined. There is evidence, however, to indicate that the declines would have been worse without the Agreement.
- There has been some movement toward self-sufficiency, although the reductions in the proportions of western grain are more due to good weather conditions than an expansion of the sector.
- Improved forage quality has reduced the province's overall demand for grain.
- The four-year timeframe for the Agreement was too short to measure major impacts and attitudinal changes. It was reasonable for some of the efforts undertaken, and trends are evident which can be adjusted for in the next agreement. The impact on legume forages was very noticeable, and suggests that this area will need less attention in future. It is a particular problem for long-term projects such as research.

- There has been a positive change in producers' attitudes about using locally grown grain.
- The most effective programs have been:
 - Incremental area incentive sub-program, and
 - Livestock feed storage and handling sub-program
- The first was effective because it made real contributions to long-term improvements in forage quality. The second resulted in funding going directly to producers to reduce production costs through investments in facilities
- The least effective program was the Incremental Production Incentive Sub-Program. It tended to support the least experienced growers and was not accompanied by a price stabilization program to encourage participants to make the long-term commitment needed.
- The Pasture Management Incentive Sub Program was not implemented until later in the Agreement, but its preliminary results seem to indicate that it is filling a need.
- The amount of technological activity was relatively high, as several projects were referred to AFA for funding before LFDSA was required to contribute.
- The technology program resulted in better Federal/Provincial communication.
- The lack of a standardized approach to post-hoc evaluations of technology projects is a shortcoming of the program that needs to be addressed.
- There is evidence of "price gouging" by equipment dealers taking place as a result of the assistance provided by the Agreement.

- While there has been expansion of the storage and harvesting capacity, this has been done without a good understanding of the need. There is a need for an inventory of both types of capacity before making any further decisions about offering funding in future. The impact of expanding on-farm storage on central facilities should also be assessed in more detail.
- Implementation was very effective, and clients liked the simplicity and responsiveness of the program
- There was considerable interest on the part of producers to become more involved in planning, implementing and evaluating subsequent agreements.

Impacts and Effects

The main conclusions concerning *Impacts and Effects* are as follows:

- The acreage targets for almost all commodities were very optimistic, and could not reasonably have been achieved within the timeframe of the Agreement.
- The yield targets were more realistic, and were met or surpassed in most cases.
- There was not much activity in protein crops or opportunity feeds, certainly well below the growth targets established.
- Some targets are generally stated, with no specific objectives. These need to be made more specific to enable better targeting of effort in future.
- The Agreement fitted well with other programs and was able to provide complementary funding and in some cases, such as technology, to obtain good leverage on the funds used.

- The conditions for sustained growth of the livestock feed industry are not evident. Most of the new grain production has been by potato growers who were attracted by the incentive payments, but may not be committed to grain production in the longer term.
- In addition, the lack of adequate incentives for the established, committed grain producers has discouraged some of these people from continuing to grow grain. These producers are the ones who are most needed to build the grain industry in the future.
- The greatest incremental impact appears to have been to speed up the adoption of good forage production and storage practices. In some ways, these were part of a trend, but the availability of additional incentives hastened adoption of new methods and techniques and thereby advanced the development of the industry.

Implementation

The main conclusions concerning *implementation* are as follows:

- The flow of information with regard to the Agreement operates smoothly and effectively from the farmers' point of view. Some concerns about internal and inter-governmental communications are still evident. These stem primarily from differences of opinion about the basic strategy of self-sufficiency, given the absence of a price stabilization program.
- The information flow appears to have been adequate to generate both a widespread awareness for the Agreement and a suitable flow of projects.
- The contribution and participation of both governments in funding the Agreement is not generally recognized at the farmer level except for larger operations. It is evident at the farm association level.

- The level of assistance was adequate to address the current situation.
- While the Management Committee had the authority to coordinate the programs, it was not as active as it could have been in using this authority to develop the industry.
- The producers that have responded in the greatest number to the stimulus of the Agreement are the dairy, potato, and beef farmers (in that order). The response has by far been the greatest from the dairy sector and is reflective of the success of the forage program.
- Regionally, client participation has been concentrated in four areas: the Western, Northwestern, Southern, and Southeastern Regions (in ranked order).
- The extension activities undertaken in support of the Agreement have consisted mostly of disseminating information about the program, providing assistance with applications, and responding to general queries about the Agreement programs. These activities have been supported by a number of projects funded under the human resources element of Program 4 which has assisted in upgrading the skills and knowledge of the regional staff with respect to livestock feed extension activities.
- Delivery of the Agreement functioned efficiently and effectively and was rated very positively by key informants and farmers alike.

Recommendations

Rationale Issues

With regard to *Rationale Issues*, we recommend the following:

- 1) Undertake a thorough review of the rationale for the Agreement.
- 2) Ensure that the Strategy, Objectives, Targets and Programs are clearly linked and complete
- 3) Develop a clearer self-sufficiency plan
- 4) Implement a grain price stabilization program.

Objectives Achievements Issues

With regard to *Objectives Achievements Issues*, we recommend the following:

- 1) Do more to improve profitability of grain producers
- 2) Increase the emphasis on pasture improvement
- 3) Develop a clear strategy for research and technology development
- 4) Provide multi-year contracts for research staff
- 5) To discourage "price gouging" by dealers, base assistance for equipment purchases, funded under the Agreement, on an average provincial price.
- 6) Evaluate the need for more on-farm grain handling facilities.

- 7) Clearly enunciate the policy on and objectives for on-site facilities.
- 8) Conduct a needs assessment for on-farm milling
- 9) Keep the Market Risk Sub-Program
- 10) Establish an industry advisory committee.

Impacts and Effects

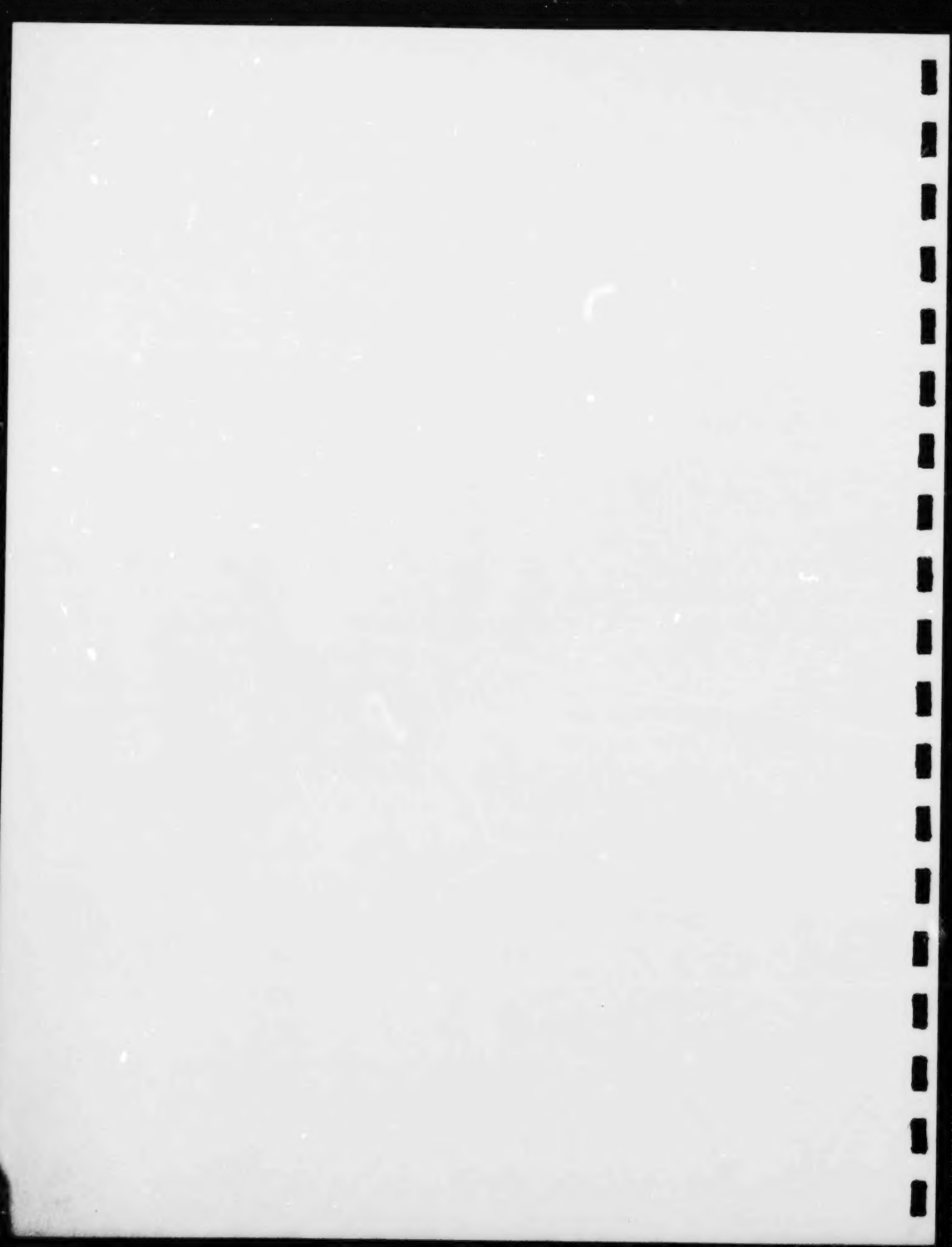
With regard to *Impacts and Effects*, we recommend the following:

- 1) Be more realistic about targets in future.
- 2) Quantify all targets
- 3) Do more promotion of protein crops
- 4) Keep the opportunity feeds component of the Agreement
- 5) Change the grain incentive program to provide better inducement for established growers to produce more.

Implementation

With regard to *Implementation*, we recommend the following:

- 1) Create a more active role for management committee in implementing and monitoring the Agreement
- 2) Appoint an Agreement Manager
- 3) Improve Data Collection and Reporting



1 Introduction

1.1 Background on the Agreement

The agricultural industry has long been recognized as a very important component of the New Brunswick economy by both the federal and provincial levels of government. Three Federal/Provincial sub-Agreements have been signed in the last fifteen years to support the agricultural industry in its efforts to increase its contribution to the provincial output.

The Canada/New Brunswick Livestock Feed Development Subsidiary Agreement, (LFDSA) 1987-1991 was developed to be incremental to and complementary with the 1984 Agri-Food Subsidiary Agreement. The central aim of LFDSA is to achieve a higher degree of livestock feed self-sufficiency and thus contribute to the ERDA objectives by increasing the contribution of the agricultural sector to the local, provincial, and regional economies.

LFDSA is an initial step in a long term process. Designers of LFDSA believed that in order to move toward livestock feed self-sufficiency, it was necessary to first change the thinking of New Brunswick farmers about the issue and then motivate them to change. The Agreement has attempted to do both of these things.

A requirement of LFDSA is that the Agreement be evaluated at the end of its four-year term. Applied Management Consultants was engaged to conduct the final evaluation of LFDSA 1987-1991. This report presents the evaluation results.

1.2 Evaluation Objectives and Focus

1.2.1 Evaluation Objectives

Our terms of reference were to assess:

1. The relevance of the programs, objectives and targets of the LFDSA to the livestock feed sector in New Brunswick in 1990.
2. The impacts and effects of LFDSA.
3. The extent of achievement of the objectives, goals, opportunities, strategic elements, and targets of LFDSA.
4. The effectiveness/efficiency of implementation of the programs.
5. The alternatives which might better achieve the objectives, goals, opportunities, strategic elements, and targets of the LFDSA.

In addition to these overall objectives, the terms of reference requested that the evaluation attempt to:

- provide useful information for the assessment and design of subsequent agreements;
- address specific evaluation issues as outlined in the interim evaluation;
- provide guidance on the development of criteria for an evaluation framework for subsequent agreements.

1.2.2 Focus of the Evaluation

Through discussion with the Steering Committee, it was agreed that the focus of this final evaluation would be on:

- Providing a comprehensive analysis of the rationale for the Agreement;
- Determining the extent to which the objectives of the Agreement have been achieved;
- Identifying and measuring the outcomes and specific impacts and effects of the Agreement.

The administrative and delivery aspects of the Agreement were to be given less emphasis as they were dealt with in a mid-term evaluation conducted in 1989.

1.3 Methodology and Data Sources

1.3.1 Data Assessment/Establishment of Evaluation Orientation and Focus

To start the project, the team made a comprehensive assessment of the available data based on the suggested data sources and methodologies outlined in the evaluation framework. The results of this assessment were documented in a report presented to the steering committee. The report included comments as to the validity and adequacy of the evaluation indicators, the data sources, and the baseline data. At that time recommendations on alternative data sources and specific areas of emphasis were made to the steering committee and suggested changes agreed upon.

The evaluation framework developed at the outset of the Agreement was modified to reflect the available data and has served as the guide for conducting the evaluation. The consultants have followed this guide in carrying out the evaluation.

1.3.2 Key Informant Interviews

The team interviewed industry and government representatives to discuss broad issues and obtain an overview of the Agreement:

- Government representatives included regional directors, field crop specialists, livestock specialists, district agriculturalists, and federal and provincial officials in Fredericton (including the New Brunswick Grain Commission).
- Industry representatives included presidents of industry associations, representatives of Co-Op Atlantic and the Florenceville Grain Centre, and selected producers.

Most interviews were conducted in person. Telephone interviews were conducted when personal interviewing could not be scheduled. The focus of these interviews was on the rationale of the Agreement, the rationale for a grain industry, and on what the future thrust of the Agreement should be.

A list of the key informants interviewed is provided in Appendix A.

1.3.3 Producer Survey

This task was a key element in our methodology. A total of 147 in-depth producer interviews were conducted. All of these interviews were on-farm and in person, and were between 45 minutes to one hour in duration. A stratified random sample of farmers was selected from the LFI database to ensure a representative mix of producers by type (primary source of income), by region, and by program and sub-program.

The distribution of the sample by region and type of producer is summarized in Exhibit 1 on the next page.

Exhibit 1

**DISTRIBUTION OF FARM SURVEY PARTICIPANTS
BY REGION AND PRIMARY SOURCE OF INCOME**

	NE	NW	W	C	S	SE	E	Total	% of Sample	Actual % LFI DB
Dairy	3	5	5	9	19	11	2	54	36.7%	39.8%
Beef	1	0	10	2	6	11	2	32	21.8%	22.4%
Potatoes	2	14	23	1	2	0	0	42	28.6%	21.0%
Grain	1	2	3	0	0	1	0	7	4.7%	3.8%
Forage	1	0	0	0	0	0	1	2	1.4%	1.2%
Sheep	0	0	1	1	0	1	0	3	2.0%	1.8%
Vegetables	0	0	0	0	0	1	1	2	1.4%	.8%
Poultry	0	0		0	0	1	1	2	1.4%	1.9%
Hogs	0	0	0	0	1	2	0	3	2.0%	2.6%

1.3.4 Collection of Statistical Data

Statistical data was collected from a number of sources. The primary source was the LFDSA database. Other data sources include Statistics Canada Crop Reports, the Livestock Feed Board of Canada, various departments of NBDA, and the statistical data collected from the participants of the farmer survey.

1.3.5 Case Studies

Case studies were conducted in five technology projects which covered each of the three technology sub-programs. The conclusions drawn from the case studies were used to supplement our general findings on the Technology Program.

1.3.6 Other Data Sources

Other data sources referred to during the course of this study included two previously completed consultants' reports on local grain storage and handling requirements. These were:

- *New Brunswick Grain Storage and Handling Requirements*; prepared for Agriculture Canada by Gardiner Pinfold Consulting Economists Limited, March 1989.
- *A Study of Storage Requirements for Marketing Feed Grains in Response to the Atlantic Livestock Feed Initiative*; prepared for Agriculture Canada by Price Waterhouse.

As well, reference was made to the *Atlantic Canada Feed Sufficiency Strategy* which was developed by the Atlantic Farmers Council.

1.3.7 Technical Appendix

A technical appendix containing the major data sources used during the course of this evaluation has been provided to Agriculture Canada and the New Brunswick Department of Agriculture and is available upon request.

This technical appendix includes:

- The Data Assessment Report For the Final Evaluation of LFDSA
- The LFDSA Evaluation Framework and Evaluation Indicators
- The key informant interview guide
- The farmer survey interview guide
- The Summary of Results from the Farmer Survey

1.4 General Comments About the Data

One of the major constraints to this evaluation was obtaining "hard" statistical data on the New Brunswick livestock feed sector. This was basically a two-fold problem. There was a general lack of baseline data and the data collected on acreage, production and other variables are not collected with sufficient rigor to give the evaluators confidence that the reporting is accurate. Where estimates have, by necessity, been made, they are described in the text of the report.

The two sources of product data are Statistics Canada Crop Reporting Series and the New Brunswick Department of Agriculture LFDSA database. Each of these sources has its own inherent weaknesses. The Statistics Canada data, for instance, is collected using a sampling procedure which most industry observers feel overstates the actual activity in the livestock feed sector. The LFDSA database, on the other hand, does not follow all clients from year to year. Clients entering the program one year and then exiting the next (or perhaps re-entering at a later date) are dropped from the database, and their production, subsequently, is not tracked. Those familiar with the

LFDSA database feel that it understates the overall production activities of the LFI clients.

1.5 Organization of the Report

The report is organized into seven chapters as follows. The preceding constitutes Chapter 1: Introduction. This discussion is followed by Chapter 2: Overview of the Agreement which provides descriptive information about the Agreement itself. Chapter 3 examines the rationale issues of the Agreement. Chapter 4 provides an evaluation of extent to which the objectives of the Agreement were achieved. Chapter 5 discusses the issues relating to the impacts and effects of the Agreement. Chapter 6 addresses the implementation issues that were raised during the evaluation. Lastly, Chapter 7 provides a summary of our overall conclusions.

2 Overview of the Agreement

2.1 Program Component Profile

The Program Component Profile for LFDSA is summarized in Exhibit 2.

As the Program Component Profile illustrates, the Agreement is comprised of four major programs with different individual thrusts. Each, however, is working simultaneously toward the overall Agreement objectives. Within these four major programs, there are several sub-programs, which have their own objectives; also working simultaneously, but toward their respective major program objectives. The four major program areas covered under the Agreement are listed below with details for each provided in the Program Component Profile:

- Livestock Feed Development
- Technology
- Marketing
- Industry Support Services

Exhibit 2
Program Component Profile

Program/Sub-Program	Objectives
1. Livestock Feed Development Incentive Program	To stimulate increased production
a. Incremental Production Incentive	To stimulate production of grain and protein crops
b. Incremental Area Incentive	To increase the legume forage production
c. Incremental Pasture Management Incentive	To increase the productivity and management of the pasture production base
2. Technology Program	To enhance the productivity and efficiency of the New Brunswick Livestock Feed sector through the development, transfer, and adoption of appropriate technology.
a. Technology Development	i) To develop cost effective, efficient and soil conserving livestock feed production system. ii) To develop new systems or components for the production, storage and handling of livestock feed. iii) To develop processing and feeding systems which improve the utilization of by-product livestock feeds. iv) To undertake livestock feed cultivar and species evaluations.
b. Technology Demonstration	To enhance the testing, demonstration, and transfer of appropriate technology in the livestock feed sector of New Brunswick.
c. Technology Acceleration	To increase the adoption of selected proved technologies that improve the efficiency and productivity of the N.B. Livestock Feed Sector.
3. Marketing Program	To strengthen the harvesting, storage, handling, and marketing of livestock feeds.
a. Industry and Marketing System Development	To further develop the efficiency and effectiveness of the livestock feed marketing system.
b. Livestock Feed Storage and Handling Facilities	To improve marketing practices, serving provincial livestock feed markets, and facilitate import replacement.
c. Custom Services	To encourage availability of services for cost efficient harvesting and handling of livestock feeds.
d. Market Risk	To encourage commercial scale production of livestock feed crops presently not being produced on a commercial basis in New Brunswick and for which a potential viable market has been identified.

Program/Sub-Program	Objectives
4. Industry Support Service Program	To enhance livestock feed managerial and technical skills, increase participation of producer organizations and provide for the delivery of the Agreement.
a. Comprehensive Farm Planning Service	To increase farm viability by increased planning and efficient use of farm resources.
b. Human Resource Development	To improve knowledge, skills, and attitudes about livestock feed development.
c. Livestock Feed Farm Organization	To increase the participation of livestock feed farm organizations in the development and strengthening of the sector.
d. Public Information and Communication	To provide information on and create awareness of the livestock feed industry and Livestock Feed Development Initiative.
e. Implementation and Evaluation	To ensure orderly and effective implementation and evaluation of Canada/N.B. Livestock Feed Initiative Programs.

2.2 Budget

2.2.1 Budget by Program

The program budgets and the share of funding by Canada and New Brunswick for the four-year life of LFDSA are presented in Exhibit 3.

Exhibit 3 - LFDSA Budgets by Program

	Program Contributions by Government (\$,000)		
	Canada	New Brunswick	Total
Development Incentive Program	4,000	1,000	5,000
Technology Program	2,620	655	3,275
Marketing Program	2,880	720	3,600
Industry Support Services	1,000	250	1,250
Total	10,500	2,625	13,125

While budgets by program are set according to the original Agreement, there is a considerable amount of flexibility for allocating budgets by sub-program each year, and during the year as well.

2.2.2 Budget and Expenditures by Year

Exhibit 4 summarizes, for each of the four programs: actual expenditures for the first three years of the Agreement, planned expenditures for the last two years of the Agreement, and percentage of budget utilized at each of these stages.

Exhibit 4
Budget and Planned Expenditures
LFDSA (1987 - 1991)

Program	Budget	Actual Expenditures as at March 31, 1990	% of Program Budget	Planned Expenditures for 1990/91	Planned Expenditures for 1991/92	Planned Expenditures to End of Agreement	% of Program Budget
Livestock Feed Incentives	\$ 5,000,000	\$3,274,846	65%	\$1,280,000	\$ 120,000	\$ 4,674,846	93%
Technology Enhancement	3,275,000	658,316	20%	1,240,000	1,070,000	2,968,316	91%
Marketing	3,600,000	1,985,341	55%	1,380,000	780,000	4,145,341	115%
Industry Support Services	1,250,000	552,643	44%	400,000	280,000	1,232,643	99%
Totals for Agreement	\$13,125,000	\$6,471,146	49%	\$4,300,000	\$2,250,000	\$13,021,146	99%

It is expected that the level of expenditure under the Marketing Program will be greater than initially estimated. The reasons for this are discussed later in the report. Funds from Programs 1 and 2 will be re-profiled into the Marketing Program to accommodate this increase.

A detailed summary of the cumulative program activity since the beginning of the Agreement is provided in Exhibit 5.

2.3 Evaluation Issues

Four classes of issues were set out in the evaluation framework. The areas were classified by priority by the Steering Committee, as follows:

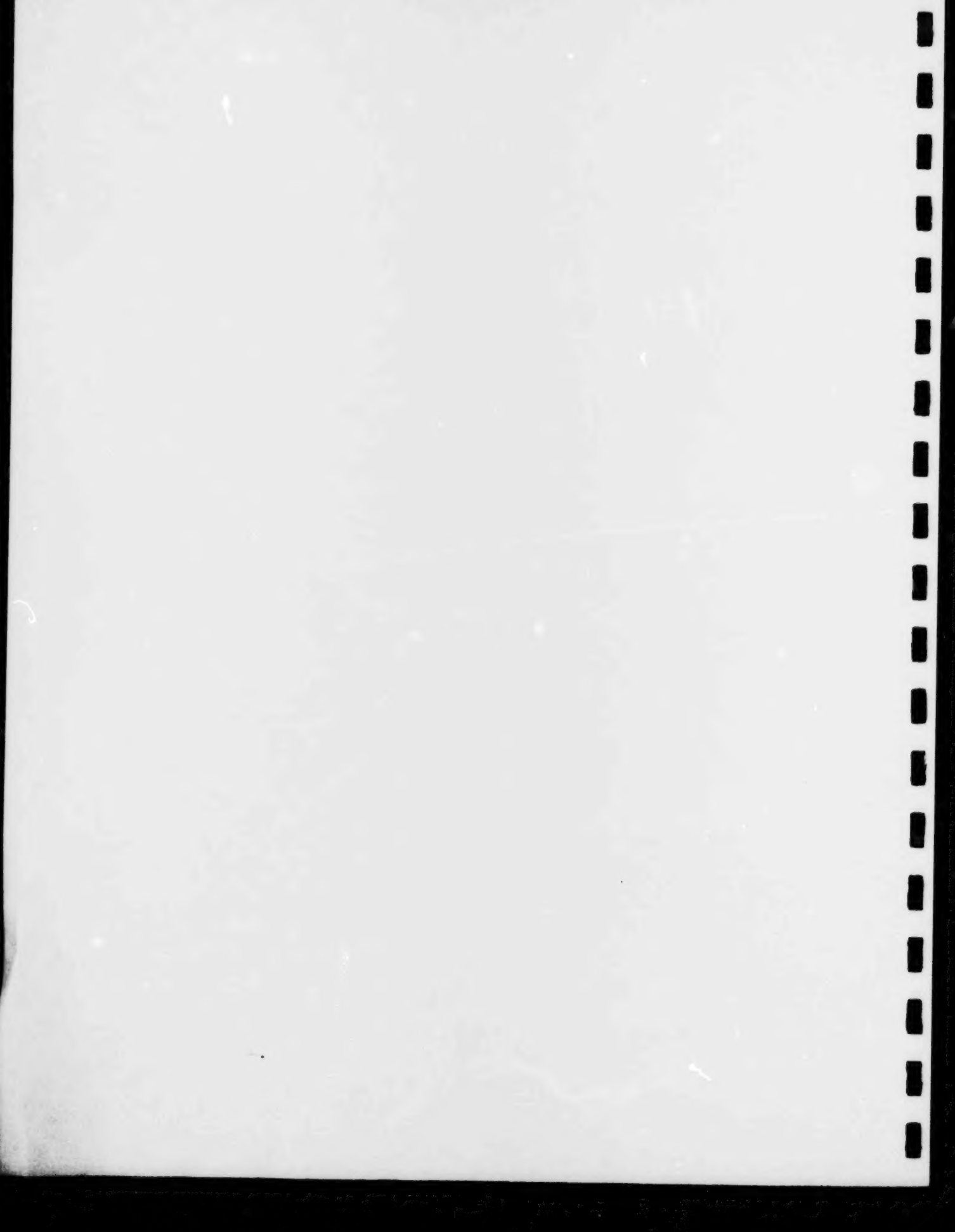
<i>Evaluation Area</i>	<i>Level of Importance</i>
• Program Rationale	• High Priority
• Objectives Achievement	• High Priority
• Impacts and Effects	• High Priority
• Program Implementation	• Low Priority

The priority consigned to the evaluation area determines the extent of analysis undertaken to address the specific issues.

Exhibit 5

Canada/New Brunswick Livestock Feed Development Subsidiary Agreement Cumulative Program Summary as of August 20, 1990								
Program	Budget	Applicants	Pending	Rejected	Approved	Expenditures	Total Commitments	% Committed of Total Budget
1. Livestock Feed Incentives*								
a. Production Incentive		1,276			695	\$1,938,022	\$1,938,022	
b. Area Incentive		773			558	\$1,276,556	\$1,276,556	
c. Pasture Incentive		650			327	\$ 183,497	\$ 183,497	
Totals	\$5,000,000	2,699			1,580	\$3,398,075	\$3,398,075	68.0%
2. Technology Enhancement								
a. Development		37	1	4	32	\$ 380,045	\$ 963,694	
b. Demonstration		60	1	7	52	\$ 376,513	\$ 680,864	
c. Acceleration		159	7	15	136	\$ 183,822	\$ 274,087	
Totals	\$3,275,000	256	9	26	220	\$ 940,380	\$1,868,645	57.0%
3. Marketing								
a. System Development		29	2	8	19	\$ 73,782	\$ 237,782	
b. On-Farm Facilities		373	10	22	341	\$1,226,055	\$1,985,048	
c. Off-Farm Facilities		17	0	3	13	\$ 490,663	\$ 499,703	
d. Custom Services		61	3	22	36	\$ 497,456	\$ 578,756	
e. Market Risk		2	0	2	0	\$		
Totals	\$3,600,000	482	15	57	409	\$2,287,956	\$3,301,289	91.7%
4. Industry Support Services								
a. Farm Planning		12		3	9	\$ 95,796	\$ 165,128	
b. Human Resource		36		5	31	\$ 101,048	\$ 114,391	
c. Organization		7			7	\$ 14,419	\$ 37,419	
d. Public Information		7			7	\$ 43,453	\$ 43,453	
e. Implementation		33		3	30	\$ 376,254	\$ 530,153	
Totals	\$1,250,000	95		11	84	\$ 630,970	\$ 890,544	71.2%
Grand Totals	\$13,125,000	3,532	24	94	2,293	\$7,257,381	\$9,458,553	72.0%

* For Program 1 the number of applicants was tracked as the cumulative number of clients that provided their production intentions over the life of the Agreement. The number of approvals was tracked as the cumulative number of clients receiving initial payments. Note that for each sub-program in Program 1 the figures presented are cumulative figures and do not distinguish between unique clients.



3 Rationale Issues

3.1 Relevance

Evaluation Question: *TO WHAT EXTENT ARE THE OBJECTIVES OF THE AGREEMENT AND ITS PROGRAMS STILL RELEVANT TO CIRCUMSTANCES OF N.B. AGRICULTURE?*

The rationale for the Agreement is based on the original rationale for the Atlantic Livestock Feed Development Initiative (ALFI): To reduce the reliance of Atlantic Canadian livestock producers on imported grain feeds by becoming more livestock feed self-sufficient.

The major proponent of this initiative was the Atlantic Farmers Council. The desire to increase livestock feed self-sufficiency and thus less reliant on outside sources of livestock feeds was prompted by the erosion of Feed Freight Assistance (FFA) over the period of 1976 to 1989. Over this period, FFA on western grains being shipped from the Lakehead to eastern Canada effectively dropped from about 6090% to about 22% of overall shipping costs.

"As a result of this erosion in Feed Freight Assistance, feed grains delivered to the Atlantic provinces cost approximately \$35 per tonne more than in Ontario."¹

The result of this cost disparity is that producing livestock in Atlantic Canada is more expensive than in Central Canada.

¹Atlantic Canada Feed Sufficiency Strategy, Atlantic Farmers Council

Some industry people fear that the FFA may be removed altogether and that if this happens, the Atlantic livestock industry could very well collapse. As stated by the Atlantic Farmers Council

".....the survival and future development of our livestock industry is seriously threatened if these feed price disparities are allowed to continue and grow. Our pork industry already finds itself in a desperate situation, a significant portion of it beyond recovery, and other sections seem likely to follow."

Several adjustments have been made in recent years to FFA's funding formula and to the Livestock Feed Assistance Act to address price disparity. However, these are only short-term measures which do not adequately address the fundamental problem. The Council proposed the following as the long term solution:

"... to become self-sufficient in forage, feed grain and protein production within the next fifteen years, and to grow the feeds at a cost which will allow our field crop and livestock producers to compete successfully in the marketing of their products."

Support for the principle of self-sufficiency remains very high among key informants and farmers. There is also virtually no disagreement on the need to continue to increase livestock feed self-sufficiency.

The circumstances which prevailed at the beginning of the Agreement have changed little during the past four years:

- Feed subsidies have not increased, and New Brunswick's livestock industry is still facing comparatively high production costs.
- Further declines in the livestock sector have actually taken place.

- Despite some good progress on forage quality, the level of dependence of the livestock sector on western grain has not changed to any significant degree (see "Objectives Achievement" for further discussion of this issue).

As far as the future is concerned, the greatest concern is the effect that free trade and GATT will have on the future size and composition of the Maritime livestock industry. The expectations are for a decline in local livestock production, particularly with respect to the hog and poultry sectors. The fear is that an influx of inexpensive American hogs and poultry will push local producers out of the market and possibly even result in the demise of the two industries.

If there is a substantial decline in poultry or hogs, feed self-sufficiency may be less of an issue simply because there will be less consumption of livestock feed.

Despite these concerns, most people in the industry feel that the initiative should not be abandoned. The future destiny of hogs and poultry is speculative at best, and it is hard to believe that governments would allow these industries to disappear - their contribution to the overall economy is substantial.

3.2 Linkages

Evaluation Question: *WERE THERE REASONABLE LINKAGES BETWEEN AGREEMENT OBJECTIVES AND PROGRAM OBJECTIVES?*

The general objectives of the Agreement were stated as follows:

"to develop a competitive and expanded livestock feed sector that enhances the long term economic viability of the livestock industry and to provide a high degree of self-sufficiency."

The objectives focus on the feed sector. However, one of the main programs, marketing, contains several aspects which are of direct benefit to the viability of the livestock industry, but in fact have little to do with the expansion of the feed sector.

The difficulty in making the linkage between programs and objectives is evident in the way the targets are formulated. Targets are expressed in terms of expanding and improving the quality of livestock feeds. None reflects how the Agreement should contribute to the viability objectives.

In our review of the Agreement, the Memorandum of Understanding between provinces and the other documents leading up to the development of the Agreement, it seems clear that the purpose was to enhance livestock feed production, and that in doing so, the other desired effects would follow.

In our interviews, we heard conflicting views about the real purpose of the Agreement, some believing that its purpose was to lead to increased self-sufficiency in feed, others believing that the purpose was a more viable livestock sector. As a result, there are different interpretations of how to implement programs, and where to focus attention.

3.3 Consistency

Evaluation Questions: 1) WERE THE ACTIVITIES AND OUTPUTS OF THE PROGRAM CONSISTENT WITH ITS MANDATE? 2) ARE THE ACTIVITIES AND OUTPUTS OF EACH PROGRAM LINKED TO THE ATTAINMENT OF ITS OBJECTIVES AND THE INTENDED IMPACTS AND EFFECTS?

The activities and outputs of the Agreement were designed to be consistent with its mandate. They were planned and executed in relation to the Agreement's overall strategy. The only area where the activities went beyond the mandate was in referring numerous technology projects to AFA. This resulted in a significant benefit for LFDSA as it allowed the funds for technology to be stretched over many more

projects. It did not negatively affect AFA as there were funds available which would have lapsed had these projects not been directed there.

The activities and outputs were well linked to the objectives, with four exceptions which are discussed in the following sections.

3.3.1 Grain Prices

Perhaps the most important consistency issue is the fact that there was no program to stabilize grain prices. This was not a fault in the design of the Agreement, but rather the result of circumstance.

LFDSA was designed with the assumption that:

"A grain stabilization program is to be negotiated outside this Agreement to stabilize the existing base and foster further development of the grain sector."²

With LFDSA designed to provide an incentive to increase production, the stabilization program would have reduced the overall risk and provided the producers with a secure return for their efforts.

The stabilization program was never implemented.

Whether results would have been very different with the proposed program is a matter for speculation. However, changes in grain prices during the Agreement seem to have caused existing producers to drop out of grain. Prices were not conducive to encouraging a high uptake in the absence of price support.

²Livestock Feed Development Subsidiary Agreement 1987-1991

An indication of this is the effect of removal of the two price system for milling wheat. When the two price system was removed two years ago, it definitely resulted in sharply reduced wheat production in the upper river valley.

3.3.2 Land Squeeze

Although the Agreement proposed to expand grain sector production, there is not a great deal of excess land available in the main grain areas. This situation may be affected by Cavendish Farm's plans to set up new production facilities in the upper Saint John river valley. There will be increased demand for land for potato production which could shift the attention away from grain, but could also result in more grain as a rotation crop.

3.3.3 Lack of Targeting

An issue raised by key informants and farmers is whether there should have been more targeting of Agreement funds at specific areas or producers where the potential was highest. For example:

- Identifying potential grain growing areas which are not developed, targeting them specifically, and seeking out producers who will make the commitments to develop them.
- Giving more flexibility to agricultural reps to develop plans for these growers on an individual basis.
- Building the industry by supporting established growers as opposed to new growers.
- Making funding limits fit the size of the operation is not considered. Currently, a farm grossing \$70,000 is treated the same as one grossing \$500,000.

While it is relatively easy to make the case that targeting of resources could have a better impact, this approach is not without its critics, and is also difficult to implement fairly. However, what has been absent is a plan relating the programs to the targets in a direct and reasonable way.

3.3.4 Last Minute Additions to Agreement

Although farmers appreciated the addition of new programs during the course of the Agreement, farmers and key informants were quick to point out the "don't do as I do, do as I say" nature of the mid-course additions to the Agreement. A case in point is hay storages. Extension staff had been emphasizing good long term planning of capital investment. The last minute addition of the hay storage program caused farmers to change their investment plans to take advantage of the program. It may have also left some of them wondering about the benefit of long-range planning when the government is liable to make last minute changes anyway.

3.4 Conclusions

The main conclusions relating to *Rationale Issues* are:

- Due to the Agreement, there has been an improvement in forage quality, but most of the conditions which created the need for the Agreement (high cost feed, lowered freight transport subsidies and a portion of western grain) still apply.
- Because the grain stabilization program did not materialize as assumed, the appropriateness of the grain production program's design cannot be evaluated fairly. In any future agreement, the price stabilization component will need to be addressed.
- GATT and free trade may lead to a decline in the livestock production in the province, which could improve the level of self sufficiency, but which will highlight the need for lowering production costs.

- There were not good linkages between the objectives, the strategy, and the targets, and some targets were not defined. As a result, there has not been a clear understanding among those implementing the Agreement as to the overall strategy.
- The Agreement assumed that "the available land base and emerging cereal technology indicated that competitive feed grain production is possible." This should be reassessed in light of the fact that no new land was put into production during the Agreement.
- The strategy provided assistance to most farmers under similar terms and conditions, whereas some observers feel that targeting of benefits or programs to specific farmers or regions would have had a greater impact.
- Changes to the Agreement which opened up funding to projects excluded at the outset disrupted the long range investment plans of some producers and worked against the governments' attempts to encourage this type of planning.

3.5 Recommendations

With regard to *Rationale*, we recommend the following:

- 1) *Undertake a thorough review of the rationale for the Agreement.*

The circumstances which prevailed at the outset of the Agreement have not changed significantly. This would tend to suggest that the need to reduce the cost of livestock feed still exists. What is not evident is whether trying to increase New Brunswick's level of self-sufficiency is realistic. If so, it is clear that the thrust must turn toward the grain sector, which saw no improvement during this Agreement, despite almost \$2 million in expenditures. There are other possibilities for reducing livestock feed costs such as improved pasture programs. There are also other valid reasons for

continuing on the path toward self-sufficiency, and considerable support for such an approach.

2) Ensure that the Strategy, Objectives, Targets and Programs are clearly linked and complete

To achieve the desired results, the overall strategy needs to be clear. There are some who believe that the Agreement's prime purpose was to move toward greater self sufficiency, whereas others see self sufficiency as a consequence of doing other things. This has led to inconsistency in government's approach to the issue. The livestock sector has been made more competitive due to grants and improved forage quality, but little has been done on the self-sufficiency issue.

3) Develop a clearer self-sufficiency plan

LFDSA tried, in a sense, to provide something for everyone, and attacked the feed production issue on many different fronts simultaneously; there was support for grain, for forage, and for pasture improvements. The goals for each type of feed were broad and beyond the scope of a four-year plan to achieve. However, in its initial concept, the Agreement had as a major, if not primary objective, increasing the production of grain. Toward this objective, virtually no progress was made. This is the key area where the next Agreement will need to focus. However, the disappointing results of LFDSA on the grain side suggest that changes will need to be made.

One of the challenges that faced the evaluation team was determining what the key informants consider as livestock feed self-sufficiency. It has been suggested by many individual in the industry that it is best defined by recognizing the deficiency in grain requirements and determining what will be required to fill the void. Given that New Brunswick is self-sufficient in forage production the main feed ingredient import is small grains.

One of the major stumbling blocks in developing a strategy to reduce dependency on imported feed grains is knowing the starting position, the points of leverage and the areas of vulnerability. As one provincial nutritionist indicated we could replace all imported feed grains by domestic grains; however, at what cost? In an effort to direct the discussions for the next Agreement we have designed a method to determine where immediate gains could be made, where more long term plans will be required and whether the cost is worth the effort. The details are given in Appendix B.

4) Implement a grain price stabilization program.

Whether or not some form of price stabilization would have made a difference is not a question to which we can give a definitive answer. However, it is clear that the incentive program which was put in place did not have much impact, and that the incentives need to be rethought. Price stabilization or some other form of safety net program could provide a better return than the present program.

If the province intends to seriously move toward greater grain self-sufficiency, there will need to be a grain stabilization program as part of, or complementary to the next Agreement. We also recommend that any stabilization program should be at least Atlantic in scope, if not national. The objective of the original Memorandum of Understanding was to achieve regional self-sufficiency, and the province's strategy needs to be kept complementary with the other efforts.

4 Objectives Achievement Issues

4.1 Objectives

Evaluation Question: *TO WHAT EXTENT HAVE THE TWO PRINCIPAL OBJECTIVES OF THE AGREEMENT BEEN ACHIEVED?*

Objective #1:

"To develop a competitive and expanded livestock feed sector that enhances the long term economic viability of the livestock and poultry industry and provides a high degree of feed sufficiency within the Province."

Objective #2: To increase the level and stability of net returns for participants in the sector.

These objectives have four component parts

- Competitiveness and Profitability
- Expansion of the sector
- Degree of self-sufficiency
- Stability of returns

4.1.1 Competitiveness and Profitability

The evaluation examined whether local livestock feeds were considered to be competitive with imported feeds, and whether the costs of livestock production had decreased. The clear consensus among the farmers surveyed was that local livestock feed was competitive with imported feeds:

- Farmers were asked whether local grain was competitive with imported grain in terms of price and quality. Their responses were as follows:

Yes	69 (49%)
No	10 (7%)
Don't Know	62 (44%)

- By type of farm, responses were fairly consistent.

	Yes	No	Don't Know
Dairy	28 (54%)	3 (6%)	21 (40%)
Beef	12 (40%)	2 (7%)	16 (53%)
Potatoes	20 (49%)	3 (7%)	18 (44%)

- A second question asked farmers to rate the quality of local versus imported feeds. Most farmers with an opinion about the issue felt that quality was comparable to or better than imported feeds:

Better quality	33 (23%)
Comparable quality	44 (31%)
Lower quality	15 (10%)
Don't Know	<u>51 (36%)</u>
	143 (100%)

In terms of price and quality, grain is generally seen as having reached a point where it is competitive with western grain.

Profitability of the livestock sector has also increased (see Exhibit 6):

- Seventy-eight percent of all farmers responding to this question believe that the LFDSA had a positive effect on the profitability of their operations.
- Ninety-one percent of dairy farmers surveyed had increases in profitability as a result of LFDSA;
- Seventy-five percent of beef farmers surveyed had increased profitability as a result of LFDSA;

Among grain producers, the story is basically positive, although there are some mixed opinions:

- While a majority of potato growers claim that the Agreement improved their profitability, the proportions of positive answers are less than for livestock producers, and a significant percentage believe that the Agreement had no effect on profitability;
- For grain growers, responses divided evenly among those who felt the Agreement had a positive effect and those who felt it had no effect or a negative effect. (It must be recognized that the size of the sample is very small due to the limited number of grain growers in the province. Another sample could yield quite different results.)

**Exhibit 6 - Summary of Responses Re:
Effect of LFDSA on Profitability By Farmer Segments**

- A = LFDSA has significantly increased my profitability
 B = LFDSA has had somewhat of an effect on my profitability
 C = LFDSA has had no effect on my profitability
 D = LFDSA has decreased my profitability
 E = I cannot say whether or not LFDSA has had an effect on my profitability

Primary Source of Income	A	B	C	D	E	Total Number of Respondents	
Beef	13%	62%	19%	3%	3%	32	100%
Dairy	13%	78%	7%	2%		54	100%
Potato	14%	54%	26%	3%	3%	42	100%
Grain	17%	33%	33%	17%		6	100%
Forage	100%					2	100%
Sheep	33%		67%			2	100%
Vegetable	50%	50%				2	100%
Poultry		100%				2	100%
Hogs		67%	33%			3	100%
All Respondents	13%	65%	18%	2%	2%	144	100%

Overall, the survey provides strong evidence that farmers consider the Agreement to have improved the profitability of their operations.

The two primary reasons cited for the improvements in profitability were:

- The LFI incentive payment itself which reduced the cost of production
- Better forage quality which resulted in higher productivity of livestock.

From the farm survey it is possible to estimate the profitability increases.

Thirty-seven respondents provided estimates of the increase in their profitability as a result of the Agreement:

- The average increase in profitability for the thirty-seven respondents was 8.8%
- Among the 7 respondents who had significant profitability increases, the average increase was 16.4%
- Among the 30 respondents who had somewhat of an increase, the average increase was 7.1%.

These are qualitative estimates, provided by the farmers. They are not based on any examination of their actual operating revenues and costs and can only be considered as indicative estimates of profitability.

Applying the average increases cited above to the proportion of farmers in each category of increase (Exhibit 6) and assuming that the few farmers experiencing a decline in profitability had reductions of 10% overall, yields a weighted average increase in profitability of 6.7%

.13 x .164	=	.021
.65 x .071	=	.046
.18 x 0	=	.000
.04 x (-.010)	=	<u>-.004</u>
Total		.067

We conclude that the Agreement resulted in an increase in the profits of the farmers by approximately 6.7% on average.

Exhibit 7 summarizes the survey responses concerning the impact of the Agreement on cost of production.

- A majority of the livestock producers had reductions in their cost of production as a result of LFDSA;
- Grain and potato growers experienced some decline in cost of production, although to a much lesser degree than the livestock producers.

Exhibit 8 provides a summary of responses from the livestock producers on the changes in their milk or meat productivity attributable to LFDSA:

- The overall effect on milk/meat productivity has been very positive. (Discounting the farmers who gave "don't know" as an answer to the question, two thirds (66%) of the respondents experienced productivity increases.)

Exhibit 7 - Cost of Production Changes
Attributable to LFDSA
(Per Unit of Output) By Farmer Segment

- 1 = Has increased significantly
 2 = Has increased somewhat
 3 = Has had no effect
 4 = Has decreased somewhat
 5 = Has decreased significantly

Primary Source of Income	1	2	3	4	5	Total Number of Respondents		Weighted Average Rating
Beef		16%	28%	56%		32	100%	3.40
Dairy	2%	4%	28%	59%	7%	54	100%	3.65
Potato	2%	5%	69%	21%	3%	42	100%	3.18
Grain	14%		57%	29%		7	100%	3.01
Forage				100%		2	100%	4.00
Sheep			33%	67%		3	100%	3.67
Vegetable				100%		1	100%	4.00
Poultry		50%		50%		2	100%	3.00
Hogs			33%	67%		3	100%	3.67
All Respondents	2%	7%	40%	41%	4%	146	100%	3.44

**Exhibit 8 - Summary of Responses Re:
Changes in Milk/Meat Productivity since Implementation of LFDSA**

- A = Has increased significantly in the last three years
 B = Has increased somewhat in the last three years
 C = Has had no effect
 D = Has decreased
 E = "Don't Know"

Primary Source of Income	A	B	C	D	E	Total Number of Respondents	
Beef		39%	32%	4%	25%	28	100%
Dairy	31%	35%	14%		20%	51	100%
Potato	15%	30%	50%	5%		20	100%
Grain	---	---	---	---	---	---	100%
Forage		100%				1	100%
Sheep			100%			2	100%
Vegetable					100%	2	100%
Poultry	50%	50%				2	100%
Hogs		67%			33%	3	100%
All Respondents	18%	36%	26%	2%	18%	109	100%

- Dairy farmers were the most positively affected. Nearly 83 percent of these respondents had had an increase in milk productivity in the last three years. Several dairy farmers indicated that because their forage had improved their production per animal, they were able to maintain their production quotas with fewer cows.

4.1.2 Expansion of the Sector

Exhibit 9 summarizes the grain area production (hectares) and grain tonnage production from 1986 to 1989, as reported by the LFI database and Statistics Canada.

Since the differences between the two data sources are very significant, we have attempted to rationalize the information to make useful conclusions.

From working with and talking to people who are familiar with both data sources, two general observations are made.

The first is that the LFI database consistently understates the total production by Agreement participants. This occurs because LFI only records production in a year when the grower is applying for benefits related to production. If he or she does not apply in a particular year, the production is not recorded for that year.

The second is that Statistics Canada data is believed to overstate production. Provincial agriculture staff feel that the nature of the sampling methodology, which is based on established growers, results in consistent overestimation of the production levels of the entire growing population.

The true reflection of industry activity is felt to lie somewhere between the two. As a result, our procedure for determining the true situation has been to present both sets of data to departmental experts and to seek their opinions about the "true" situation.

Exhibit 9
New Brunswick
Grain Production (Hectares)

Table A - LFI Database

	Year	Barley	Wheat	Rye	Hulless Oats	Grain Corn	Triticale	Totals
Client Since 1987	1986	6,084	2,106	111	6	107	17	8,431
	1987	7,601	1,716	121	64	246	25	9,773
	1988	6,024	1,338	45	157	179	24	7,767
	1989	6,139	1,103	147	97	212	3	7,701
Client Since 1988	1986	1,981	453	0	0	---	0	2,434
	1988	1,780	275	47	30	---	35	2,167
	1989	1,607	226	11	41	---	7	1,892
Client Since 1989	1986	248	26	1	---	12	0	287
	1989	614	73	0	5	0	0	692
All Clients	1986	8,313	2,585	112	6	119	17	11,152
	1987	7,601	1,716	121	64	246	25	9,773
	1988	7,804	1,613	92	187	179	59	9,934
	1989	8,360	1,402	158	143	212	10	10,285

Table B - Statistics Canada Data Crop Reporting

	Year	Barley	Wheat	Subtotal		Oats		Grand Total
	1986	10,644	3,845	14,489		13,117		27,606
	1987	10,525	4,250	14,775		12,145		26,920
	1988	11,740	4,050	15,790		12,145		27,935
	1989	12,955	4,050	17,005		12,550		29,555

In the case of barley, the LFI data indicates that product area has remained virtually unchanged. Statistics Canada data, on the other hand, indicates a 2300 hectare (or 22%) increase in barley area since 1986. The conclusion of provincial specialists is that barley area has increased over that period, but not by the magnitude suggested by Statistics Canada. An increase of between 500 and 750 hectares was felt to be a reasonable estimate. Regionally, there has been a slight decline in barley area in the grain belt, but this has been more than offset by increased acreage in the southern part of the province.

Although modest, the overall increase in barley acreage was viewed positively by the grain specialists, who have been encouraging farmers to grow barley rather than oats because barley is a higher energy crop than wheat and it requires less management for equivalent or better yields than other crops.

In the case of wheat, the LFI data show a marked decrease in area while Statistics Canada data show a nominal increase (5%). Grain specialists are in agreement that there has been a decrease in wheat area provincially. The major source of that decrease came from a sharp decline in milling wheat production in the grain belt. The sharp decline in milling wheat production is attributed to two factors. The first factor was the removal of the two price system for milling wheat some two years ago. The second reason is that there was a serious fusarium disease problem with milling wheat grown in the upper river valley in 1988 and 1989. The reduction in area is felt to be approximately 700-800 hectares. There is also an indication that during that period some wheat growers switched to other grains such as barley.

The decline in wheat production was isolated to the upper valley region. According to grain specialists there was some increase in area in the southern part of the province.

Weighing all these factors, our best estimate is that wheat area declined by approximately 500 hectares.

The net effect on all grain production is basically no change or, at best, a nominal increase in area over the life of the Agreement.

In terms of tonnage of production, the picture is considerably brighter. Exhibit 10 summarizes the grain production tonnage for the period 1986 to 1989. Again, as with the data related to area, there are differences between Statistics Canada and the LFI database. However, in both cases, the trends are similar. Production increased close to 50% in three years. Almost all of the increase came from barley (as was the case with acreage), with wheat and oats increasing marginally. Recognizing that acreage for grain and oats declined, the yield increases for all grains have been very significant.

The general consensus among grain specialists is that tonnage increases are virtually totally attributable to the weather. The Agreement may have had some small impact on the increases due to improved management practices; however, in general, it is believed that the Agreement has not been in place long enough to have had any significant impact on yield through improved management or on research into improved varieties.

It is clear that the expanded production objective has not been met; in fact, there has been a decline in the grain production area in the province.

Exhibit 10
New Brunswick
Grain Production (Tonnes)

Table A - LFI Database

	Year	Barley	Wheat	Rye	Hulless Oats	Grain Corn	Triticale	Totals
Client Since 1987	1986	12,462	4,042	346	3	792	13	17,658
	1987	20,314	4,678	183	104	937	48	26,264
	1988	15,716	2,675	77	450	1,002	19	19,939
	1989	19,144	3,132	388	158	1,080	7	23,909
Client Since 1988	1986	2,505	708	---	---	---	---	3,213
	1988	3,750	452	104	17	---	41	4,394
	1989	5,349	682	12	125	---	17	6,185
Client Since 1989	1986	476	---	---	---	---	---	476
	1989	2,039	195	21	8	---	---	2,263
Client Since 1989	1986	15,443	4,750	346	3	792	13	21,347
	1987	20,314	4,678	183	104	937	48	26,264
	1988	19,466	3,157	181	467	1,002	60	24,333
	1989	26,532	4,009	421	291	1,080	24	32,357

Table B - Statistics Canada Data Crop Reporting

	Year	Barley	Wheat	Subtotal		Oats		Grand Total
	1986	30,050	11,700	41,750		27,600		69,350
	1987	34,840	13,960	48,800		25,910		74,710
	1988	35,500	13,880	49,380		26,220		75,600
	1989	45,296	13,609	58,905		28,990		87,895

4.13 Livestock Feed Self-Sufficiency

Despite the decline in area, the province has moved toward greater self-sufficiency in grain.

The volume of grain produced and imported provides an indicator of the progress that has been made toward self-sufficiency since the inception of the Agreement.

	<u>1986</u>		<u>1989</u>	
Grain Production (Tonnes)	69,350	(32%)	87,895	(40%)
Imported Grains (Tonnes)	<u>150,100</u>	<u>(68%)</u>	<u>131,981</u>	<u>(60%)</u>
	<u>219,450</u>	<u>100%</u>	<u>219,876</u>	<u>100%</u>

However, as discussed under the previous section, it is evident that local production improvements have resulted from good yields rather than expansion of the sector.

Although we can make no conclusive statement about the extent to which the province's grain production can displace imported grain, it does appear that during the Agreement demand for imported grain has decreased.

One of the major feed company grain suppliers in the province noted about a 7% decline in demand for processed feed in the past year and attributed this directly to reduced livestock populations, a result of improved productivity.

Also some of the reduced demand for imported grain feeds comes as a result of the improved forage quality programs of the Agreement.

Farmers themselves certainly believe the province has become more self-sufficient:

- Eighty-six percent of producers in our survey felt that the province has moved closer to feed self-sufficiency since the Agreement. There was little variation by type of farmer on this issue.
- By type of farm, seventy-one percent of the livestock farmers believe that their own farms are nearer to livestock feed self-sufficiency since the Agreement was implemented (see below).

IS YOUR FARM NEARER TO LIVESTOCK FEED SELF-SUFFICIENCY?

<i>Primary Source of Income</i>	<i>Yes</i>	<i>No</i>
Dairy	36 (72%)	14 (28%)
Beef	22 (79%)	6 (21%)
Potato	12 (60%)	8 (40%)

4.2 Time Frame

Evaluation Question: *IS THE TIME FRAME OF THE AGREEMENT REALISTIC IN TERMS OF THE SITUATION IT IS ADDRESSING?*

The timeframe of the Agreement was too short to achieve sustained measurable progress. The four-year horizon of LFDSA generated some uncertainty as to government's intentions about a long-term support of the strategy. Indications are that some producers were reluctant to make a long-term commitment, particularly to grain production, without some assurance that there would be a longer term support system in place.

A second issue is the targets which were set. The target objectives were designed for the long-term and as such were overly optimistic for a four year Agreement. We concur with the conclusion from the Interim evaluation in this regard:

"While it is our general conclusion that a new direction in feed production has been started, significant measurable progress will take time. Attempting to quantitatively measure success based strictly on production levels during a four-year time frame is unrealistic since the first hurdle is as much psychological as it is physical."

The timeframe was too short to adequately mount a research program.

Provincial staff stated that there is a reluctance on the part of the Province to undertake research that requires the hiring of research technicians since no one wants to be responsible for the ongoing costs after the Agreement expires.

Federal staff echoed similar concerns. They feel that the long term uncertainty makes it difficult to do any long term planning or to develop any continuity with research projects funded under LFDSA. For example, the federal Department hired a research technician. They are required to apply annually for assistance under the Agreement to keep this person on staff and usually do not know the researcher's status until the last minute. The future of the research technician after the Agreement is also uncertain. Federal staff believe that the loss of the research technician at the end of LFDSA will significantly set back the research that they have conducted thus far under the Agreement.

4.3 Evaluability/Validity

Evaluation Questions: 1) *CAN IT BE DETERMINED WITHIN ITS LIFESPAN WHETHER THE OVERALL AGREEMENT OBJECTIVES HAVE BEEN ATTAINED?*
2) *CAN THE ACHIEVEMENT OF PROGRAM TARGETS BE CREDITED UNEQUIVOCALLY TO PROGRAM ACTIVITIES AND OUTPUTS OF LFDSA?*

From the discussion above it is evident that the answer to the first question is that the overall Agreement objectives will not be attained within its lifespan. As previously noted, progress is evident but it is unrealistic to assume that the very high targets will be met within the life of LFDSA.

As to the second question, the answer is no. Many respondents on the farm survey directly and unequivocally credited LFDSA with improvements to their profitability. In reality, however, there were also numerous other extraneous factors at work which make it difficult, if not impossible to attribute successes in the livestock feed sector to LFDSA alone. These extraneous factors include:

- Grain prices and general market/economic conditions.
- Climatic and weather conditions which tended to provide very good yields for several years of the Agreement.
- Extension activities of several respondents, particularly those in the Department of Agriculture, believe this contributed as much, if not more, to attainment of objectives, as did financial assistance.
- The reduction in livestock production; this is expected to significantly reduce the local demand for livestock feed.

- The effect of agricultural agreements which have preceded LFDSA such as AFA; these have had an effect on what has happened in the industry in the last three years.

We believe it is unrealistic to expect to isolate any area of government programming and assess cause and effect "unequivocally". Unlike the laboratory, government experiments are not done under controlled conditions, which isolate all extraneous factors. Thus, while we cannot give a positive answer to the evaluation question, we believe it is fair to state that the program and activities of LFDSA have contributed to meeting Agreement targets.

4.4 Effectiveness

Evaluation Question: *WHICH PROGRAMS HAVE BEEN THE MOST AND LEAST EFFECTIVE IN ACHIEVING THE OBJECTIVES OF THE AGREEMENT?*

4.4.1 Program 1: Livestock Feed Development Incentive Program (LFI)

Grain

Although grain production was to be the main contributor to increasing self-sufficiency, results from this part of the Agreement are generally viewed as disappointing. The program was rated as only low to moderately successful by the key informants, and there has been virtually no increase in grain acreage after four years.

It is clear that acreage did not increase. However, several respondents feel that the prevailing market conditions would have caused sharp declines in acreage without LFI. Potato farmers, for instance, might have used another crop for rotation purposes; the incentive made the choice to stay with grain more viable. Although not quantified in this study, the indication is that the area would probably have declined had it not been for the program.

Three specific concerns were raised about the effectiveness of the grain component of Program 1:

- The incentive favours new growers more than the existing growers. This seems to have kept the more professional growers out of participating and possibly making significant commitments to increasing the efficiency of their production;
- A long-term commitment to cash crop grain growing is not evident among the cash crop producers who were helped;
- Many who planted grain for rotation would probably have done so without the LFI incentive.

Our findings from the farmer survey support these findings. Exhibit 11 gives the top two reasons for growing grain given by beef, dairy and potato producers.

The potato farmers are motivated to grow grain because it is a good rotation crop and they can get an incentive for growing it. Dairy and beef producers grow grain for rotation with other forages, but many also primarily grow it for feed purposes. Beef and dairy farmers' motivation for growing grain is more closely linked to the objectives of the achievement (i.e., greater feed self-sufficiency) and subsequently would suggest more of a long-term commitment to growing the crop than potato farmers.

Exhibit 11
Summary of LFI Farmers' Primary Reasons for Growing Grain

Primary Reasons	Beef		Dairy		Potato		All Respondents	
	# 1 Reason	# 2 Reason	# 1 Reason	# 2 Reason	# 1 Reason	# 2 Reason	# 1 Reason	# 2 Reason
As a cash crop	4%	12%	3%	10%	7%	61%	10%	34%
For rotation purposes	33%	41%	55%	31%	81%	13%	58%	25%
For own feed requirement	63%	35%	39%	49%	12%	26%	32%	36%
For bedding		12%	3%	10%			1%	5%
	100%	100%	100%	100%	100%	100%	100%	100%
No. of Responses	24	17	31	29	42	38	111	92

The grain program had some positive results in terms of quality improvements. Over the last four years, there has been a positive change in producers' attitudes about using locally grown feeds. On the farmer survey, livestock producers were asked about local versus imported feed grains. Sixty-two percent said that they prefer local grain and another 30% did not have a preference. Only 8% preferred western grain. In order, the reasons for preferring local grain were:

- To support local farmers
- Local grain is of equal quality
- Local grain is of better quality
- Convenience

When asked specifically how LFI has changed their attitude toward purchasing grain, over half (51%) of the producers responded that they are now more inclined to purchase local grain.

Forage

The forage program was unanimously rated as the most successful component of the Agreement by key informants and producers. The Agreement clearly accelerated the trend toward improved quality by enhancing existing trends and by giving farmers the funds to do more. Industry observers note that prior to the Agreement, legume production and improvement were recognized as important, but they were lagging.

Pasture

The pasture program was not actually implemented until well into the second year of the Agreement and has only a small budget of \$75,000 allotted to it. However, based on the early success of the program, the amount of budget and emphasis placed on the program has gradually been increased and a good uptake of the program has been evident.

The consensus among the key informants is that farmers using the pasture program are moving toward more controlled grazing.

From the farmers' perspective, the program also appears to have had a positive effect. Sixty-nine percent (59 of 85) of those surveyed who made pasture improvements said that the productivity and/or quality of their improved pasture has increased since the program came into effect; 22% experienced significant increases.

The pasture program has enjoyed some early success and it is a program that has worked well for the producers who have used it. The indication is that the program

has only "scratched the surface". There are still many pasture areas around the province that need to be improved.

4.4.2 Program 2: Technology Program

As indicated earlier, there were technology projects undertaken under both AFA and this Agreement. The level of program activity for both AFA and LFDSA are summarized in Exhibit 12. Some of the typical projects funded include:

- Development and evaluation of corn hybrids for New Brunswick
- Development of a program to determine mycotoxin in cereals
- Meat pulp feeding of hogs (opportunity feeds)
- Nutritional value of lupins
- Development of a system to determine dairy cow feeding behaviour and an efficient ratio formulation
- Development of "fodder beets" as a potential crop
- Development of rhizobium superinocula for soybeans

Technology Case Studies

Because the programs were very diverse and the type of projects differed considerably, we undertook case studies of five different projects. The cases covered all three program areas.

The lessons learned from the case studies are summarized below.

Technology Development

The two development project cases involve research to develop improved crop varieties and hybrids. The two projects demonstrate the problem of the timeframe of the Agreement; while research by nature is a long-term activity, the funding is available for only four years.

Exhibit 12
Livestock Feeds Technology Projects Funded
Under AFA and LFDSA

	1987/88	1988/89	1989/90	1990/91*	Totals
AFA Technology Projects					
<i>Technology Demonstrations:</i>					
No. of Projects	57	13	-	-	70
Amount (\$)	\$192,685	\$33,134	-	-	\$ 225,819
<i>Technology Acceleration:</i>					
No. of Projects	16	8	-	-	24
Amount (\$)	\$158,469	\$44,291	-	-	\$ 202,760
Grand Totals					
No. of Projects	73	21	-	-	94
Amount (\$)	\$351,154	\$77,425	-	-	\$ 428,579
LFDSA Technology Projects					
<i>Technology Development:</i>					
No. of Projects	-	4	12	16	32
Amount (\$)	-	\$30,301	\$294,838	\$638,554	\$ 963,693
<i>Technology Demonstration:</i>					
No. of Projects	-	5	16	31	52
Amount (\$)	-	\$19,820	\$186,618	\$424,426	\$630,864
<i>Technology Acceleration:</i>					
No. of Projects	-	6	26	118	150
Amount (\$)	-	\$38,508	\$88,231	\$147,349	\$274,088
Grand Total					
No. of Projects	-	15	54	165	234
Amount (\$)	-	\$88,629	\$569,687	\$1,210,329	\$1,868,645

* As at August 20, 1990

The other important point demonstrated by these cases is the need for government involvement in research; both show that the Maritime market is so small that the private sector will not invest in R&D without the type of assistance available.

Technology Demonstration

The two demonstration projects served to "get the ball rolling" in two areas where there has been very limited commercial activity; the development of protein crops and the development of opportunity feeds. The preliminary results in both projects have been encouraging enough that they may warrant serious consideration as acceleration projects in a follow-up Agreement.

Technology Acceleration

The project yielded exactly the results it was supposed to; it resulted in improved productivity and cost savings for the producers that adopted the technology. However, despite the benefits, there was no evidence of further uptake. Our findings suggest that more needs to be done to promote successful "real life" cases of technology adoption to other regional extension staff as well as other producers. As well, a review of the minimum area requirement is also warranted to ensure that all that can benefit from new technologies are eligible for assistance to adopt it. The project also showed how "price gouging" can take place; as soon as assistance was provided, the equipment prices went up.

CASE STUDY # 1: CULTIVAR EVALUATION (AGRICULTURE CANADA)

(Technology Development)

Funding was provided to Agriculture Canada staff for cultivar evaluations on a variety of new cereal grains, to be conducted over a three year period starting March 1989.

Some of the positive features of this project are:

- It is consistent with the type of ongoing research that industry experts feel is important to sustaining and developing a livestock feed industry
- It provided an opportunity for federal and provincial staff to work together which helped to improve communications
- It provided assistance for the hiring of a research technician

The key concerns that surfaced from this project review are as follows:

- In other parts of Canada, industry is usually more active in funding this type of research. Because of the size of the market and the scale of grain production in the Maritimes, it is too risky for the private sector to get involved in this type of work.
- From their perspective, the research component of LFDSA has too much "red tape". AFA gave the federal staff more flexibility to conduct the type of research that they wanted to do.
- The limited timeframe of the Agreement and the requirement to apply for funding annually make it difficult to do long-term project planning or to develop any research continuity.

CASE STUDY # 2: DEVELOPMENT OF CORN HYBRIDS FOR NEW BRUNSWICK (PRIVATE SECTOR)

(Technology Development)

This project was continued from AFA. The project has a four-year timeframe (currently in fourth year) and involves evaluating which parents and which lines will produce the best corn hybrids for New Brunswick.

The positive results of the project include:

- This type of research is consistent with what industry observers feel is necessary to sustain and develop the industry.
- The project appears to have accomplished what it set out to do. The project coordinator started out with 1,800 lines four years ago which have been screened down to a few hundred potential parents. Several good hybrids have already been identified and the project coordinator is confident that by the end of the project, 10 - 12 hybrids will be identified that will be suitable for the New Brunswick growing climate.

While the project coordinator was fairly optimistic about the results of the project he did raise several concerns:

- Market development is an issue. Once successful hybrids have been identified and tested there is a question of how and to whom the hybrids will be marketed. The market in this region is too small to attract private interests whereas in Western Canada the role of commercialization is performed by the private sector.
- As noted in Case # 1, the market is too small to attract the private sector to this type of research. Therefore, if hybrid research is to be done, it must be government supported.
- This type of research takes about five years to get conclusive results. In looking at other projects of this nature, this Agreement and follow-up Agreements need to be sensitive to this fact.

CASE STUDY # 3: ON-FARM LUPIN DEMONSTRATION (NBDS)
(Technology Demonstration)

Funding was provided to an NBDA field crop specialist to demonstrate lupins as a potential protein crop. The project involved the monitoring of twenty carefully selected on-farm lupin demonstration sites throughout the province.

Lupins were selected as a potential protein crop because of the problems encountered thus far with growing soybeans in New Brunswick. Soybeans, by their nature, place a lot of demands on the farmer; they require extensive site preparation, seed preparation, and maintenance. Lupins, on the other hand, while not as high in protein content, require much less attention and are much easier to grow.

These lupin demonstrations were conducted in 1990 under some very adverse weather conditions. From an evaluation standpoint, the field crop specialist notes that these were actually ideal conditions under which to compare results. Given the stressful conditions, the field specialist feels that he was able to draw some fairly solid preliminary conclusions as to which soil conditions and regions of the province are best suited for growing lupins.

Some observations can be made from the preliminary results:

- There are wide gaps in the protein contents of soybeans and lupins. Therefore, lupin performance should be rated primarily on yields.
- Lupins appear to grow best under very sandy conditions and in rotation with carrots (because of the fine preparation of feed beds); Kent County and Sackville appear to be the best growing regions in the province.
- Early seeding is critical to good yields.
- The preliminary evidence provided from this year's work may warrant moving this from a demonstration to an acceleration project in a subsequent Agreement.

CASE STUDY # 4: LOCAL OPPORTUNITY FEEDS FOR FINISHING BEEF (NBDA)

(Technology Demonstration)

The project examined the use of french-fried potato by-products for finishing beef. Forty young cattle were used in the demonstration. Half were fed dry hay and grain, the other half were fed potato by-product and supplement.

The key points identified during this project review were:

- Potato by-products used with a supplement can offer substantial cost savings to conventional methods of feeding beef.
- The preliminary results indicate that under the right conditions, the potato by-product will yield comparable weight gains and meat quality to conventional methods of feeding, but at a much lower cost. The early research suggests that the by-product works best:
 - on large animals (650 lbs and over); if they are fed too early, the meat becomes too fatty and loses quality
 - by using by-product and supplement at first, until the animal gets to 750 to 800 lbs, then the by-product alone can be used for finishing
 - on leaner breeds; there is a better chance for an A-1 carcass with breeds such as Simmental, Charolais, and Limousine.
- More research will be needed to fine tune the preliminary findings.
- The results from this project have generated interest from other beef producers. Indication is that some producers are already using it in their operation.

CASE STUDY # 5: DUAL HOPPERS, DRILL FILL SYSTEM (PRIVATE SECTOR)

(Technology Acceleration)

Two producers received funding under this umbrella project to purchase a dual hopper drill-fill system. This basically consists of a bulk box with augers that is divided into parts; fertilizer is put in one box, seed in the other. The system is said to result in significant labour savings to grain producers and facilitate the bulk purchases of fertilizer and seed (at reduced costs).

Key findings were:

- The systems worked well for the two producers that received assistance. Significant labour and cost savings were realized.
- Despite the benefits realized by the above producers, there was no evidence of further uptake of the systems. Moreover, there is no evidence that the above successes were promoted to other regions of the province through regional staff.
- Price gouging was evident. The first producer that purchased the system did so at a cost of about \$5,000. The second producer faced a \$1,500 price hike from the dealer on the subsequent system purchased (there is only one dealer in the province).
- A minimum area requirement for purchasing grain equipment automatically disqualified a number of smaller producers who could have benefited from the purchase of the system.

Two specific developments which will be important considerations in a future Agreement are:

- An international trend toward more sustainable growing practices that are less intensive. Research will be needed to help local growers reduce the use of growth hormones and chemicals that are harmful to the soil
- The passing of the Breeders' Rights Act which will allow local growers access to European varieties which previously were not available. Research is needed to determine the adaptability and suitability of these crops for New Brunswick

Another reason for continued emphasis on R&D is that not much was done under the Agreement with respect to areas such as protein crops and opportunity crops. Without adequate research, it is difficult to determine the actual potential of these crops and to determine whether they should be a focus of subsequent agreements. Again, progress has been evident in the last year and a half in terms of conducting more research in these areas.

Another item of concern relates to the lack of a standard format and procedures for conducting and disseminating post-hoc reviews of technology projects.

These are not done in any consistent systematic fashion now.

4.4.3 Program 3: Marketing Program

Industry and Marketing System Development

The Industry Marketing System Development Program has as its objective: "to further develop the efficiency and effectiveness of the livestock feed marketing system".

To date, 17 projects have been funded representing some \$237,782 in approved funding. A list of these projects is provided in Exhibit 13. Expenditures for 15 projects funded in the first three years totalled only \$73,782. These projects involved purchases of equipment as well as important studies of storage facilities and services. These studies are very crucial in establishing the storage strategies. In the past year, a major project involving \$136,000 is being undertaken; a precleaning operation for the Restigouche South Soil and Crop Association. This involves four off-farm grain dryers for the St. Quentin area. This has been the largest single project funded under this program and it should be monitored closely as it will be a good indicator of the effectiveness of this component of the Marketing Program.

Exhibit 13 - Listing of Typical Projects Funded Re: Industry and Marketing System Development (Program 3A)

- Grain Grading Equipment
- Seed Cleaning Facility
- Forage Sampling Equipment
- Grain Test Equipment
- Protein Analyzer and Grain Grinder
- Gravity Separator
- Grain Storage Studies
- Industry System Development Project

Livestock Feed Storage and Handling Facilities

The objective of this sub-program is "to improve marketing practices, service provincial livestock feed markets and facilitate import replacement".

Exhibit 14 indicates the projects which have been funded under this sub-program. A total of \$2,119,000 has been spent under this sub-program.

Exhibit 14 - Livestock Feed Development Agreement - Program III
Marketing Summary of Activities

Activity	1987/88	1988/89	1989/90
Grain Grading	3	6	0
Grain Storages	22	55	21
Grain Dryers	2	0	1
Forage Storages	13	30	20
Hay Driers	2	6	3
Hay Storage	0	0	0
Feed Systems	0	0	0
Custom Combines	9	8	11
Marketing Budget	\$443,907	\$875,000	\$800,000

Source: LFDSA Database (Prepared by the New Brunswick Department of Agriculture)

A particular area of emphasis has been grain and forage storage facilities.

The data in Exhibit 15 indicates that there has been incremental grain storage capacity of 338,850 bushels added under the Agreement. This new storage capacity represents roughly half of the incremental increase in grain production. (18,500 tonnes x bu/tonne = 670,000 bu.)

Exhibit 15 - Livestock Feed Storage Capacity

**Exhibit 15 - Livestock Feed Storage Capacity
(Completed Projects)**

	1987	1988	1989	Totals
Grain (bus.) Storage Capacity	51,288	195,909	91,653	338,850
Number of Projects	10	31	18	59
Forage (cu. ft.) Storage Capacity				
Tower Silo	219,931	377,591	285,127	882,649
Number of Projects	12	18	12	42
Horizontal Silo		108,400	87,180	195,580
Number of Projects		6	6	12
Total Forage (cu.ft.) Storage Capacity	219,931	485,991	372,307	1,078,229
Total Number of Forage Related Projects	12	24	18	54

Source: LFDSA Database

Increased storage capacity has not kept up with increases in production and the general consensus among grain specialists is that more on-farm storage is needed.

However, whether more capacity is needed must also take into account the following:

- There is no data available on on-farm capacity. Steps need to be taken to have a good data base.
- A study³ carried out during the Agreement concluded that central storage facilities were a more cost effective option.
- Funding on-farm feed mills reduced the revenues and viability of central feed mills. The central mills claim that the new on-farm storages displaced volume from central facilities.
- There has been no increase in the grain acreage; if yields decline, the need for storage will also decline.

Recent modifications to the Agreement added hay storage facilities as eligible projects. Activity in this is only evident in the last year. The comments from farmers and key informants are that this has been a positive change and which should stay and maintain its visibility for a subsequent agreement. As with grain storage, a plan needs to be developed to determine what the industry's requirements are.

Custom Services

The Custom Services Sub-Program was designed "to encourage the availability of services for cost efficient harvesting and handling of livestock feed".

³*New Brunswick Grain Storage and Handling Requirements*; prepared for Agriculture Canada by Gardiner Pinfold Consulting Economists Limited, March 1989.

So far, the focus of this sub-program has been on custom combining services. Forage harvesting equipment was eligible under the original guidelines, but no projects of this nature were approved until 1990.

Twenty-eight new combines were funded under the Agreement (see Exhibit 16). The owners of these combines estimated that they would combine a total of 5,508 hectares or roughly 200 hectares per combine. This includes combining on their own farms as well as custom work. NBDA has estimated that approximately 70% of this work would be custom work⁴. Therefore, the custom combining capacity added under the Agreement amounts to approximately 3,850 hectares. As there was virtually no increase in the amount of land being used for grain over the same time period, the custom combine services must have displaced other services or old equipment.

Although the evidence is that the province is well supplied with harvesting equipment, there is a belief that more harvesting capacity is still needed. A typical comment was: "When harvest time rolls around, you can't beg, borrow or steal a combine".

The actual harvesting capacity of the province can be estimated from the 1986 Census of Agriculture. The census reports that there are 724 combines in the province. This amounts to one combine for every 40 hectares. It is not known how many of these combines were actually operational. Some industry observers noted that the census contains many old combines that are not being used. Even allowing for this, the theoretical capacity would seem more than adequate.

⁴In 1990, NBDA introduced, as a condition of assistance, a minimum requirement of 75% off-farm combining.

Exhibit 16
Summary of Custom Service Combine Acreage

	1987	1988	1989
Number of Combines Assisted	10	, 7	11
Cumulative Number of Combines Assisted	10	17	28
Intended Acres to be Harvested (Cumulative Hectares)	4,423 (1,790)	7,428 (3,007)	13,606 (5,508)
Actual Cumulative Harvested (Cumulative Hectares)	4,198 (1,700)	6,617 (2,679)	10,715* (4,338)
* Estimate based on 9,716 acres reported by 26 operators plus an estimate of 1,000 acres for two operators that did not report figures for 1989.			

Source: LFDSA Database

The key problem is the short window of opportunity for harvesting. Even though the area of a particular farm may be small, harvesting must be done when the weather dictates, and a certain degree of flexibility is needed. We are unable to draw any definite conclusions about the need for more assistance without better data on the actual situation.

Some concerns were raised by the farmers who had used custom services. These farmers supported the use of a custom combining service as an alternative to buying a combine, because of the high capital costs involved.

However, over half of the farmers using the service (53%) complained that custom services reduced their yields:

- Thirty percent of the respondents indicated that they had lost yield because of a timing problem in the delivery of the service; the service simply was not available when they were ready to take the crop off.
- Twenty-three percent of the respondents complained that the operators left a lot of the crop in the fields.

Market Risk

The objective of the Market Risk Program is "to encourage commercial scale production of livestock feed crops presently not being produced on a commercial basis in New Brunswick and for which a potential viable market has been identified".

There were two applications under this element of the Marketing Program, but none was approved. Therefore, this program has not yet had any effect in achieving the objectives of the Agreement.

The lack of uptake does not necessarily mean that the program should be dropped from any subsequent agreement.

Grain will be depended on more in future to move toward self-sufficiency. This will necessarily involve some experimentation and risk. Even though its use cannot be predicted in advance, this type of program offers the flexibility to respond to opportunities which arise.

4.4.4 Program 4: Industry Support Service Program

The Industry Services Support Program was not a high priority for evaluation and we have not examined the program in any depth.

However, the implementation component was discussed with producers and with key informants. It was also extensively examined on the interim evaluation.

Expenditures are shown in Exhibit 17. A total of \$890,544 in funding has been committed to Program 4 thus far. This represents 9.4% of total Agreement commitments to date. Most of these funds (\$ 530,153 or 60%) have been directed toward program delivery and communication.

Exhibit 17
Summary of Program Activities Funded
Under Industry Support Services
(Program 4)

	1987/88	1988/89	1989/90	1990/91	Total
4a. Comprehensive Farm Planning (No. of Farm Plans)	-	2	3	4	9
4b. Human Resource Development (Individuals/Group)	1	7	17	6	31
4c. Livestock Feed Farm Organization (No. of Farm Organizations' Projects)	1	1	3	2	7
4d. Public Information and Communication (No. of Projects)	4	3	-	-	7
4e. Implementation (No. of Projects)	6	7	10	7	30

B. Program Summary

	Budget	Applicants	Pending	Rejected	Approved	Expenditures	Total Commitments	% Committed of Total Budget
Industry Support								
Farm Planning		12		3	9	\$ 95,796	\$ 165,128	
Human Resource Organization		36		5	31	\$ 101,048	\$ 114,391	
Public Information		7			7	\$ 43,453	\$ 43,453	
Implementation		33		3	30	\$ 376,254	\$ 530,153	
Totals	\$1,250,000	95		11	84	\$ 630,970	\$ 890,544	71.2%

Implementation and delivery were very effective. Over 80% of farmers rated the implementation as a "1" or "2" on a five point scale for all delivery variables. (See Exhibit 18.)

The one issue which arose under this program was the request on the part of producers for more involvement in planning and implementation of the Agreement:

- Eighty percent of the key informants felt that both farmers and farm organizations should be included in the planning and design of agreements.
- Sixty percent of key informants felt that farmers and government should be involved in the implementation, monitoring and evaluation of agreements.
- Thirty percent of key informants felt that the evaluation portion should include a producer review.
- Several responses indicated that there is a need for more industry involvement in planning and implementation.

Exhibit 18
Summary of Farmer Ratings on
LFDSA Program Delivery

Using a Rating Scale of 1 to 5 (1 Being the Highest Score, 5 Being the Lowest Score)

How Would You Rate the Program Delivery:

% of Respondents	1	2	3	4	5	Average Rating
Helpful (Receptiveness to Professional Advice)	66%	25%	8%	1%	--	1.44
Efficient processing of applications	71%	18%	9%	1%	1%	1.43
Efficient processing of claims	53%	28%	11%	5%	3%	1.77
Ability to get good explanation of benefits of program	64%	28%	5%	3%	--	1.47
Helpful in filling out applications	73%	20%	5%	1%	1%	1.37
Quality of information received	63%	29%	5%	2%	1%	1.49
Amount of information received	58%	33%	5%	3%	1%	1.56

4.5 Conclusions

The main conclusions concerning *Objectives Achievement* are:

- The Agreement has had a positive effect on the profitability and competitiveness of the livestock sector. This has resulted primarily from improved quality of forages and the direct infusion of funds from the Agreement
- Similar benefits are not evident for livestock feed producers who are not also livestock producers.
- There has been no expansion of the grain sector. In fact, during the Agreement, grain acreage has declined. There is evidence, however, to indicate that the declines would have been worse without the Agreement.
- There has been some movement toward self-sufficiency, although the reductions in the proportions of western grain are more due to good weather conditions than to an expansion of the sector.
- Improved forage quality has reduced the province's overall demand for grain.
- The four-year timeframe for the Agreement was too short to measure major impacts and attitudinal changes. It was reasonable for some of the efforts undertaken, and trends are evident which can be adjusted for in the next agreement. The impact on legume forages was very noticeable, and suggests that this area will need less attention in future. It is a particular problem for long-term projects such as research.

- There has been a positive change in producers' attitudes about using locally grown grain.
- The most effective programs have been:
 - Incremental area incentive sub-program, and
 - Livestock feed storage and handling sub-program
- The first was effective because it made real contributions to long-term improvements in forage quality. The second resulted in funding going directly to producers to reduce production costs through investments in facilities
- The least effective program was the Incremental Production Incentive Sub-Program. It had low uptake, tended to support the least experienced growers and was not accompanied by a price stabilization program to encourage participants to make the long-term commitment needed.
- The Pasture Management Incentive Sub Program was not implemented until later in the Agreement, but its preliminary results seem to indicate that it is filling a need.
- The amount of technological activity was relatively high, as several projects were referred to AFA for funding before LFDSA was required to contribute.
- The technology program resulted in better Federal/Provincial communication.
- The lack of a standardized approach to post-hoc evaluations of technology projects is a shortcoming of the program that needs to be addressed.
- There is evidence of "price gouging" by equipment dealers taking place as a result of the assistance provided by the Agreement.

- While there has been expansion of the storage and harvesting capacity, this has been done without a good understanding of the need. There is a need for an inventory of both types of capacity before making any further decisions about offering funding in future. The impact of expanding on-farm storage on central facilities should also be assessed in more detail.
- Implementation was very effective, and clients liked the simplicity and responsiveness of the program
- There was considerable interest on the part of producers to become more involved in planning, implementing and evaluating subsequent agreements.

4.6 Recommendations

1) Do more to improve profitability of grain producers

Livestock producers seem to have derived the greatest benefit from the Agreement in terms of profitability improvement, whereas the objective was to make the feed sector generally more profitable. This issue is closely related to the need for a price support program, and reinforces the recommendation of the previous section that there will be little further progress on grain production until producers can make a reasonable return from it.

2) Increase the emphasis on pasture improvement

The Agreement has been successful in accelerating forage improvement practices around the province. Much was accomplished, and the industry has adopted these improvements for the long-term. This is the opportunity to shift resources to other areas where improvements are needed which offer better returns for the expenditures involved.

3) Develop a clear strategy for research and technology development

Good progress has been evident with the Technology Program since the mid-term evaluation. However, the lack of a clear strategy on research and technology development is an impediment to the achievement of the program objectives. This strategy should address such areas as the Agreement timeframe issue, post-hoc reviews of projects, and better Federal/Provincial working relationships. Moreover, it should provide a clear plan on how to achieve the specific objectives of the program.

4) Provide multi-year contracts for research staff.

The current year to year approach which is currently used to fund research staff is not conducive to doing any long-term planning or for developing any continuity with research projects funded under LFDSA. A multi-year approach is more in-tune with the nature of the research work being conducted.

5) To discourage "price gouging" by dealers, base assistance for equipment purchases, funded under the Agreement, on an average provincial price.

This requires requesting quotations from equipment dealers around the province ahead of time to establish an average price for eligible equipment. The level of assistance provided would be based on the average price from the initial bids, rather than an artificially inflated price set by an individual dealer.

6) Evaluate the need for more on-farm grain handling facilities.

The assistance provided for on-farm facilities expanded producers' capacity considerably. The need in future will be dependent on the rate of expansion of grain production. The two must go hand in hand. The evaluation should start with a complete inventory and a policy on the role of central facilities.

7) Clearly enunciate the policy on and objectives for on-farm feedmills.

Central facilities' volume will decline as more on-farm feedmills are developed. In order to allow them to plan for the future, they should have a good understanding of the direction being encouraged through the Agreement.

8) Conduct a needs assessment for combines.

The evaluation has indicated that custom combining services may not be enough to meet all producers' needs. On the other hand, there is, theoretically enough capacity in the province. A survey of needs should be undertaken to have a better understanding of the situation and of what grain growers feel they need in the way of assistance with combining capacity.

9) Keep the Market Risk Sub-Program.

Even though there was no uptake of this program, it serves a useful purpose in the event a good project should develop. The flexibility should remain to be able to deal with such situations.

10) Establish an industry advisory committee.

There should be an advisory committee of producers, associations, and the two government departments to review the Agreement on a regular basis, provide consultation on guidelines, and identify issues of concern for evaluation and/or program amendments.

5 Impacts and Effects

5.1 Impacts/Effects

Evaluation Question: *TO WHAT EXTENT HAVE A'L AGREEMENT PROGRAMS ACHIEVED THEIR INTENDED TARGETS?*

5.1.1 Grain Yields

TARGET: TO INCREASE AVERAGE YIELDS OF CEREAL GRAIN PRODUCTION FROM 2.5 TONNES PER HECTARE TO 3.3 TONNES PER HECTARE BY THE YEAR 1995.

There has been good progress on improving grain yields throughout the province (see Exhibit 19). Overall, for the province, Statistics Canada estimates that yields have attained a level of 3.46 tonnes per hectare⁵, exceeding the targeted yields for grain.

For the group of producers who have been LFI clients, yields have not quite attained provincial goals. However, since this group generally represents the newer growers, the progress which has been made is very good. There should be no difficulty meeting grain yield targets by 1995.

According to NBDA specialists, the 1989 yields reflect very good growing conditions and cannot all be attributed to improved management. However, management and improved varieties are acknowledged as having been improved during the life of the Agreement and this objective can be met.

⁵This is for barley and wheat only

Exhibit 19
Average Grain Yields
(Tonnes/Ha)

	Year	Barley	Wheat	Total Average Grain Yields
LFI Clients	1986	1.86	1.83	1.91 ¹
	1987	2.67	2.72	2.69 ¹
	1988	2.49	1.96	2.45 ¹
	1989	3.17	2.86	3.14 ¹
Statistics Canada Data	1986	2.82	3.04	2.88 ²
	1987	3.31	3.28	3.37 ²
	1988	3.03	3.48	3.13 ²
	1989	3.50	3.36	3.46

¹All eligible grains

²Barley and wheat only

5.1.2 Forage Yields

TARGET: TO INCREASE AVERAGE FORAGE YIELDS FROM 5.5 TONNES PER HECTARE TO 6.2 TONNES PER HECTARES BY 1990.

At the time the objectives were developed, the only available measure of forage yield was tame hay as reported by Statistics Canada. The tame hay yields by year since the start of the Agreement are as follows:

1985	5.40	tonnes/hectare
1986	4.67	tonnes/hectare
1987	5.31	tonnes/hectare
1988	5.41	tonnes/hectare
1989	6.67	tonnes/hectare

The interim evaluation suggested that a revised baseline of 5.4 tonnes per hectare for 1985 was the appropriate starting point. In 1986, tame hay yields declined significantly, then worked their way back up to a point in 1988 equal to the 1985 level and had achieved a level well beyond the target by 1989. Whether this level will be sustained cannot be determined without another year or two of experience. However, if the other years are a good indication, not much progress has been made on tame hay.

However, the bigger issue, is how yields have fared for the forage crops which were targeted under the Agreement. Unfortunately, there is no data available to answer the question. Only acreage data is collected - production data is not reported to or collected by LFDSA.

Crop specialists and the individual farmers we interviewed reported a steady improvement in yield, although in most cases yield is viewed in terms of the nutritional value of the new forages versus the old ones.

5.13 Legume Products

TARGET: TO EXPAND LEGUME PRODUCTION BY 6,000 HECTARES BY 1990.

The estimated annual legume forage area production increases during the Agreement are shown in the table below:

Exhibit 20
Forage Area (Hectares)
For All LFI Clients

	Alfalfa	Birdsfoot Tr.	Total
1986	887	20	907
1987	2,268	119	2,387
1988	3,170	354	3,524
1989	3,343	392	3,735

New acreage development slowed down in 1989. We do not know yet whether this was a one-time reduction or if new acreage has levelled off. If 1990, production increased by the average of the three previous years; the total increases in area will be equal to approximately 5,100 hectares. In addition to this, there have undoubtedly been some expansions which have not involved any applications for assistance. While area may fall somewhat short of the target of 6,000 hectares, the shortfall will not be significant, progress has been good, and the trend to increased area seems likely to continue.

5.1.4 Forage Quality

TARGET: TO INCREASE AVERAGE FORAGE QUALITY FROM 8% PROTEIN CONTENT TO 12% CONTENT BY 1990.

To the extent that the Agreement resulted in improvements to the legume forage quality in the province, the average protein content level for all forages will increase. No data was collected to measure the protein content for all forages. However, data was gathered relating to legume forages.

Legume forage quality has improved substantially since 1985, as summarized below:

Exhibit 21
Summary of Legume Forage Protein Content Levels

	1986	1987	1988	1989
Protein Content				
• Lab Trials	11.5%	10.6%	14.2%	15.9%
• Farmer Survey	11.8%			16.4%

Forage protein content level data comes from two sources. The first source is based on NBDA lab trials on producer-provided haylage samples for July of each year. The second set of data is taken from the farmer survey. Forty-four respondents provided figures on their stored forage protein content levels. These were averaged for the years 1986 and 1989.

The four-year trend represented by both data sources indicates that there has been a significant increase in legume forage protein content levels. This sharp increase, according to industry observers, was only evident after LFI. Protein content levels above 12% are said to have been rare prior to LFI. According to both the key

informants and the farmers, the improvement is directly attributable to the Agreement.

The data is consistent with farmers' qualitative assessments of the trend in forage protein content and quality. Forage producers were asked about their experience with the quality of their stored forage since their involvement in LFI. Seventy-seven percent indicated that their stored forage quality had increased since LFI; 32% indicated significant increases. Furthermore, one-half of the respondents indicated that an increase in stored forage quality helped to reduce their livestock feed purchases and that this was primarily influenced by LFI.

5.1.5 Expansion of Grain Production

TARGET: TO EXPAND GRAIN PRODUCTION BY 16,000 HECTARES

The Agreement has fallen far short of the mark in relation to grain production area. Statistics Canada estimates for 1990 indicate an increase of 994 hectares. As previously stated, this probably overstates the actual area in production, but it uses the same baseline as was used to develop the objectives in the first place.

Exhibit 22 - Grain Production Area - (Hectares)

	1986	1987	1988	1989	Net Change ('89 vs. '86)
Commodity					
Wheat	3,845	4,250	4,050	4,050	205
Oats	13,112	12,140	12,140	12,550	(562)
Barley	10,644	10,525	11,740	12,995	2,351
Total Grain Area	27,601	26,915	27,930	29,595	994 (+7.2%)

Source: Statistics Canada Crop Reporting

For the substantial investment made in production incentives for grain, there has been very little return. The total increase in the three major grains combined, amounts to 1,994 hectares according to Statistics Canada, with approximately 300 new hectares of other grains under production. Agriculture Canada believes that the increase was probably closer to 500 hectares than 1,994 hectares. The total progress made in increasing the nutritional value of the grains is somewhat better than this. Whereas barley represented only 38.5% of total grain production in 1986, by 1989, it represented 43.9%.

5.1.6 Expansion of Protein Crop Production

TARGET: TO EXPAND PROTEIN CROP PRODUCTION BY 900 HECTARES BY 1990, YIELDING AN AVERAGE 3.3 TONNES PER HECTARE.

The LFDSA database indicates that there has only been one project under the Agreement to commercially produce protein crops. This is a 17 hectare soybean project.

In addition, there is experimental work being done on protein crops under the technology program. These include on-farm lupin demonstrations and on-farm soybean demonstrations.

Specialists interviewed during the evaluation still feel there is good potential for development in this area, but that the objectives need to be very modest, reflecting the almost experimental nature of this type of activity in New Brunswick.

5.1.7 Opportunity Feeds

TARGET: ENHANCE THE USABILITY OF OPPORTUNITY FEEDS.

There has been virtually no progress made on opportunity feeds. The two projects which were developmental or experimental, included:

- the meat pulp feeding of hogs
- beef finishing on culled potatoes and potato waste.

5.1.8 Pasture Improvement

TARGET: INCREASE THE PRODUCTIVITY AND IMPROVED MANAGEMENT OF PASTURE LAND.

This program has only operated during the last two and one half years of the Agreement. In total, the number of hectares treated are as follows:

Annual	630	hectares
Perennial	244	hectares
Rejuvenated	<u>1,050</u>	hectares
Total	1,924	hectares

This is a very small proportion of the total pasture area of the province and the impact is virtually insignificant.

As stated earlier in the report, staff believe that the pasture program has been effective in encouraging pasture management practices for those who have used the program, and has shown the benefit of pasture improvement incentives in lowering costs of production.

5.2 Duplication of Effort

Evaluation Question: ***WAS THERE ANY DUPLICATION, OVERLAP OR CONFLICT OF ONE PROGRAM WITH ANOTHER?***

There was no evidence of any duplication of effort between programs within the Agreement and this was not raised as an issue with the farmers or the key informants. In terms of programs external to the Agreement, our findings suggest that there has been a good fit between LFDSA and other programs, particularly AFA and CAAFD.

One area where there was some overlap initially was between the technology components of AFA and LFDSA. However, as reported, this was used to the advantage of the Agreement.

5.3 Sustained Growth

Evaluation Question: ***HAS THE AGREEMENT CREATED THE CONDITIONS FOR SUSTAINED GROWTH?***

There are different answers for grain and for forage.

Regarding grain, it is clear that the Agreement did not create the conditions for sustained growth. However, the Agreement was designed to be complementary to a price stabilization program, and it would appear that stabilization was more important for developing the industry than the incentives under the program.

The other point which must be noted is that the decline in grain production would probably have been worse had there not been an Agreement.

While the conditions for sustained growth may not yet be there, the Agreement at least appears to have been successful in changing attitudes toward local grain, which is a critical first step in the process. Some specific examples of this are provided in Exhibit 23.

Farmers' attitudes towards local grain are generally very positive. Farmers are very positive about growing grain versus purchasing it (69% were more positive). LFI appears to have had an effect on this with 76% of respondents indicating LFI had an impact on their attitude.

Forage trends under the Agreement have been very positive and have set the stage for even further improvements in this area. Improvements in quality, yields and production were evident and should be sustained in the future. It seems as if the timing was right for this initiative, and it helped speed up a trend that probably would have happened anyway.

5.4 Unintended Effects

Evaluation Question: *WHAT UNINTENDED IMPACTS AND EFFECTS HAVE RESULTED FROM THE PROGRAMS; E.G. GEOGRAPHICAL CONCENTRATION OF PARTICIPANTS, LOSSES ON FARMERS NOT PARTICIPATING IN THE AGREEMENT?*

Perhaps the most serious of the unintended effects of the Agreement was that it discouraged a number of established grain producers with large grain acreages from expanding their production. While established growers were still eligible for assistance under the Agreement, the incremental nature of the incentive payment scheme seemed to favour new producers with limited experience in producing grain. Most of these new producers started with zero bases and were essentially rewarded for their total grain production. Established growers, on the other hand, started with large base acreages. The incentive was much less attractive to them as they were rewarded only for their incremental production and not their total production for the year.

Exhibit 23
Summary of Farmer Responses Re:
Attitude Towards Local Grain

**Attitude Towards Growing
vs. Buying Grain**

Primary Source of Income	More Positive	More Negative	Indifferent	Total
Beef	11	1	6	18
Dairy	25	2	7	34
Potato	12	-	5	17
All Respondents	52 (69%)	4 (5%)	19 (26%)	75 (100%)

**Impact of LFI On Growing
vs. Buying Grain**

	Major Impact	Some Impact	No Impact	Total
Beef	3	5	3	11
Dairy	7	14	2	23
Potato	3	7	1	11
All Respondents	13 (27%)	29 (59%)	7 (14%)	49 (100%)

**Attitude Towards Purchasing
Local vs. Imported Grain Feeds**

	Prefer Local	Prefer Imported	No Preference	Total
Beef	10	1	7	18
Dairy	17	3	9	29
Potato	12	-	3	15
All Respondents	41 (62%)	5 (8%)	20 (30%)	66 (100%)

**LFI Effect on Changing Attitude
Toward Purchasing Local Grain**

	More Inclined to Buy Local	Less Inclined to Buy Local	No Change	Don't Know	Total
Beef	9	-	16	2	27
Dairy	26	-	18	1	45
Potato	9	-	6	-	15
All Respondents	50 (51%)	- (0%)	44 (46%)	3 (3%)	97 (100%)

Lastly, because of the success of the forage program, it may have been an unintended effect of the Agreement to channel such a high proportion of benefit to the dairy industry as it actually did. A review of the LFI data indicates that dairy farmers constitute about 40% of the client base while provincially, they represent about 23% of the total number of farmers.

5.5 Incrementalism

Evaluation Question: *WOULD THE PROPOSED CHANGES HAVE HAPPENED OVER A PERIOD OF TIME WITHOUT ASSISTANCE?*

Only 40% of the grain growers surveyed indicated that the assistance from LFI helped them decide to grow grain. The responses varied by sector as follows: beef 33%, dairy 50%, potato 73%. Potato farmers clearly felt that the incentive encouraged them to grow more grain.

Of further note is the fact that 49% of the respondents said they would have grown grain without the assistance; 17% said possibly for a total of 66% who may have grown grain without LFI. The response rate was somewhat higher for the beef and dairy farmers indicating that the incentive payment perhaps was not a major determinant for them. Forty-three percent of the potato farmers, on the other hand, said they would not have grown more grain without the assistance. Again, another testament to their motivation for growing the crop; it is a good rotation crop and they can get an incentive to grow it.

When asked about their future intentions about growing grain, 28% of the farmers said that they planned to grow more; 53% planned to grow about the same; 10% said they would grow less or switch to another commodity. This suggests intentions of fairly constant or slightly expanded grain production by existing grain growers in future, given a continuation of current conditions.

With regard to on-farm grain storage, 50% of the respondents who increased their on-farm storage would not have done so without government assistance. For forage producers, 30% said that they would not have increased their on-farm storage without government assistance.

The Agreement had an incremental impact on encouraging potato growers to produce grain.

One positive effect noted by almost everyone we spoke to was that the Agreement aided considerably in getting farmers to "jump on the bandwagon" than might have otherwise been the case. This is particularly true in the case of forage crops legume.

5.6 Conclusions

The main conclusions concerning *Impacts and Effects* are as follows:

- The acreage targets for almost all commodities were very optimistic, and could not reasonably have been achieved within the timeframe of the Agreement.
- The yield targets were more realistic, and were met or surpassed in most cases.
- There was not much activity in protein crops or opportunity feeds, certainly well below the growth targets established.
- Some targets are generally stated, with no specific objectives. (e.g. pasture, marketing, opportunity feeds). These need to be made more specific to enable better targeting of effort in future.
- The Agreement fitted well with other programs and was able to provide complementary funding and in some cases, such as technology, to obtain good leverage on the funds used.

- The conditions for sustained growth of the livestock feed industry are not evident. Most of the new grain production has been by potato growers who were attracted by the incentive payments, but may not be committed to grain production in the longer term.
- In addition, the lack of adequate incentives for the established, committed grain producers has discouraged some of these people from continuing to grow grain. These producers are the ones who are most needed to build the grain industry in the future.
- The greatest incremental impact appears to have been to speed up the adoption of good forage and storage practices. In some ways, these were part of a trend, but the availability of additional incentives hastened adoption of new methods and techniques and thereby advanced the development of the industry.

5.7 Recommendations

1) Be more realistic about targets in future.

It is clear that the grain acreage targets were highly optimistic, as were the targets for protein crops. In future agreements, the targets should be developed by the process we described earlier. Targets must be linked to programs and budgets to tie the strategy and the expected outcomes together in a realistic way.

2) Quantify all targets

Some of the targets are not quantified at all. This does not provide any direction to the implementation team as to the importance, priority or degree of effort expected in meeting them. If they are not quantified, it is easy not to try to do anything to meet them.

3) Do more promotion of protein crops.

The uptake of this aspect of the Agreement was very low, although staff still see it as offering potential for meeting the Agreement objectives in the future. The experience of the Agreement suggests that these projects may require more "push" to make them succeed -- simply having the programs available has not worked.

4) Keep the opportunity feeds component of the Agreement

This is another area of the Agreement in which there has not been much activity. The sense among the staff is that there are a very limited number of good potential projects of this type out there. However, the Technology case studies showed that some promising work is still being done in this area and it should be kept to provide a "safety valve" for any good projects that may come along in the future.

5) Change the grain incentive program to provide a better inducement for established growers to produce more.

The Agreement did not offer much incentive for the growers who were already producing grain, but whose needs for assistance were different from those offered to the new growers. The established growers are the ones who will be the most committed to grain in the long-term and they should be encouraged to do more to develop the grain industry. This new incentive program will need to be accompanied by a price stabilization program which will make it profitable for the established growers to expand their production.

6 Implementation

The implementation issues relating to the Agreement were dealt with extensively on the Interim Evaluation. This section will discuss briefly our findings since the Interim Evaluation.

6.1 Funding Levels

Evaluation Question: *WAS THE LEVEL OF ASSISTANCE PROVIDED TO PRODUCERS BY THE AGREEMENT ADEQUATE TO ADDRESS THE CURRENT SITUATION?*

The Agreement funding levels appear to be reasonable. Only two of the farmers surveyed raised this as an issue; none of the key informants raised this as an issue. The farmers who had concerns in this area felt that the funding percentages were too low and should be raised and that the ceilings on funding also needed to be adjusted upward. Overall, however, this was not seen as a major issue by those interviewed.

6.2 Decision Making

Evaluation Question: *DID THE MANAGEMENT COMMITTEE HAVE SUFFICIENT AUTHORITY TO CO-ORDINATE THE PROGRAMS AND ENSURE THE OVERALL SUCCESS OF THE IMPLEMENTATION PROCESS?*

The decision-making process was viewed very positively by both the producers and the key informants, particularly on an individual project basis. In particular, clients liked the simplicity of implementation; the lack of "red tape" was viewed as a very positive feature of the Agreement.

6.3 Participation

Evaluation Questions: 1) *WHICH COMMODITY GROUP OF FARMERS HAVE RESPONDED IN GREATEST NUMBERS TO THE STIMULUS OF THE AGREEMENT?* 2) *WHICH GEOGRAPHICAL REGIONS, INCOME GROUPS, AND TYPE OF FARM OPERATION MADE THE GREATEST USE OF THE AGREEMENT PROGRAMS?*

An analysis of participation by commodity group by region is summarized in Exhibit 24.

Dairy farmers have been the most responsive to the Agreement. This group ranked highest on all participation indicators used. The next highest response came from potato growers, followed by the beef farmers. These three producer groups have formed the nucleus of the client base over the life of the Agreement. One of the more disappointing statistics in this summary is the relatively low penetration of farmers whose primary source of income is grain.

By reviewing Exhibits 25A and 25B, we can see that regional uptake closely mirrors the provincial distribution of producers.

In terms of participation indicators, the region with the greatest response was the western region; the three regions that had the lowest responses to the Agreement were the central, northeast, and eastern regions. This is identical to the provincial distribution of farmers.

Exhibit 24
Ranking of Primary Income Groups
By Various Participation Indicators

Primary Income	By Number of LFI Participants		By Program 1** Expenditures		By All Other Program** Expenditures		NB Sector Penetration		Average Ranking
	Ranking	% Total	Ranking	% Total	Ranking	% Total	Ranking	% Total	
Dairy	1	41.8%	1	43.5%	1	48.5%	1	47%	1.00
Potato	3	22.1%	2	32.0%	2	21.8%	2	43%	2.25
Beef	2	23.5%	3	9.7%	4	5.4%	3	22%	3.00
Grain	4	4.0%	4	6.3%	3	12.8%	4	27%	3.75
Hogs	5	2.6%	5	3.6%	5	1.7%	5	15%	5.00
Poultry	6	2.0%	6	0.9%	6	0.3%	6	15%	6.00
Sheep	7	1.8%	7	0.7%	8	0.2%	-	-	7.33
Vegetables*	9	0.9%	8	0.4%	7	0.1%	7	7%	7.75
Forages*	8	1.3%	9	0.3%	9	0.2%	-	-	8.67
Base Totals	704	100.0%	\$3,274,845	97.4%	\$2,103,195	92.0%	2,170	32%***	

* Data unavailable for sheep and forages penetration rates

** Do not add up to 100%. Difference is expenditures for "Other" and "Unknown" which have not been included in analysis

*** Average Penetration Rate for all LFI Clients (704-2,170=32%).

Exhibit 25A
Ranking of Regions
By Participation Indicators

LFDSA Region	By Number of LFI Participants		By Program 1 Expenditures		By All Other Program Expenditures		Average Ranking
	Ranking	% Total	Ranking	% Total	Ranking	% Total	
Western	1	30.7%	1	37.3%	2	23.3%	1.33
Northwest	4	14.4%	2	23.9%	1	27.1%	2.33
Southern	2	19.0%	3	16.5%	4	16.0%	3.00
Southeast	3	18.6%	4	12.9%	3	17.7%	3.33
Central	5	9.8%	5	6.5%	5	7.5%	5.00
Northeast	6	4.5%	6	2.0%	6	5.0%	6.00
Eastern	7	3.0%	7	0.9%	7	3.4%	7.00
Base Totals	704	100.0%	\$3,274,845	100.0%	\$2,103,195	100.0%	

Exhibit 25B
Comparative Distribution of Producers
(LFI vs. Provincial Distribution)

LFDSA Region	LFI Clients		No. of N.B. Producers	
	Ranking	% Total	Ranking	% Total
Western	1	30.7%	1	25.6%
Southern	2	19.0%	3	18.0%
Southern	2	19.0%	3	16.5%
Southeast	3	18.6%	4	12.9%
Central	5	9.8%	5	6.5%
Northeast	6	4.5%	6	2.0%
Eastern	7	3.0%	7	0.9%
Base Totals	704	100.0%	\$3,274,845	100.0%

6.4 Extension Activities

Evaluation Question: *WHAT EXTENSION ACTIVITIES HAVE BEEN UNDERTAKEN IN SUPPORT OF THE AGREEMENT?*

Extension activities have been an important component of the Agreement. These activities have consisted of circulating fliers, brochures, and information packages about the Agreement programs, on-farm visits and organizing trips, displays and demonstrations. The role of extension services in the delivery of the Agreement is confirmed by the fact that 77% of the farmers surveyed learned about LFDSA from their local agricultural rep. Most of the queries about the program and assistance with filling out applications were provided by the local reps.

The human resources component was used by regional staff to put on seminars, symposiums, and expositions on livestock feed development. As well, regional demonstration projects were funded under this program.

The extension activities undertaken by the regional staff in support of the Agreement were viewed positively by the farmers. Farmers gave high ratings to the local reps' help in matters relating to the Agreement.

6.5 Program Delivery

Evaluation Questions: 1) *HAVE THE PROGRAM DELIVERY MECHANISMS FOR ALL PROGRAMS FUNCTIONED EFFICIENTLY AND EFFECTIVELY?* 2) *HAVE PROGRAM INPUTS AND OUTPUTS BEEN DELIVERED ON TIME AND ACCORDING TO THE AGREEMENT TIME FRAME?*

To repeat an earlier observation, delivery mechanisms were felt to be very effective. Producers gave particular praise to the staff who were involved in the delivery of the programs for their helpfulness and efficiency.

6.6 Information Flow

Evaluation Questions: 1) *WAS THE INFORMATION COMMUNICATION SYSTEM ADEQUATE TO MAINTAIN THE FOCUS OF PROGRAM ACTIVITIES ON PROGRAM OBJECTIVES AND TARGETS?* 2) *WAS IT ADEQUATE TO DEVELOP A WIDESPREAD AWARENESS AND UNDERSTANDING OF THE AGREEMENT AND ITS PROGRAMS, AND TO GENERATE A SUITABLE FLOW OF PROJECTS?* 3) *WERE THE CONTRIBUTIONS OF THE N.B. DEPARTMENT OF AGRICULTURE AND AGRICULTURE CANADA RECOGNIZED, AS WELL AS THE PARTICIPATION OF BOTH GOVERNMENTS?*

From the farmers' perspective, the flow of information has operated smoothly and effectively. The only exception was some isolated comments about a lack of information at the outset, which has since been rectified.

The key informants had concerns with respect to internal communications and communications between the two levels of government. There are still inherent differences of opinion about the basic strategy of self-sufficiency. This stems primarily from the fact that the conditions for which the Agreement was originally designed did

not actually exist after it was put in place; namely, there was no price stabilization program for grain. Implementers were reluctant to proactively promote the grain component of the Agreement because producers would not be able to make money on the crop without some form of a stabilization program.

The information communication system appears to have been successful in creating awareness of the Agreement and in generating a suitable flow of projects. This was a bit of a problem in the early stages of the Agreement as some programs had low uptake, due in part to the slowness in getting some of the program information out initially. However, over the life of the Agreement, the farm community has responded well to the programs offered. There appears to be no shortage of applications for assistance.

The joint federal and provincial involvement in the Agreement is not well understood by individual farmers. Most farmers deal directly with the (provincial) regional department staff and, therefore, only the provincial involvement is visible to them.

In contrast to individual farmers, there is a good understanding of the dual participation at the farm organization and association level.

6.7 Conclusions

- The flow of information with regard to the Agreement operates smoothly and effectively from the farmers' point of view. Some concerns about internal and inter-governmental communications are still evident. These stem primarily from differences of opinion about the basic strategy of self-sufficiency, given the absence of price stabilization program.
- The information flow appears to have been adequate to generate both a widespread awareness for the Agreement and a suitable flow of projects.

- The contribution and participation of both governments in funding the Agreement is not generally recognized at the farmer level except for larger operations. It is evident at the farm association level.
- The level of assistance was adequate to address the current situation.
- While the Management Committee had the authority to coordinate the programs, it was not as active as it could have been in using this authority to develop the industry.
- The producers that have responded in the greatest numbers to the stimulus of the Agreement are the dairy, potato, and beef farmers (in that order). The response has by far been the greatest from the dairy sector and is reflective of the success of the forage program.
- Regionally, client participation has been concentrated in four areas: the Western, Northwest, Southern, and Southeast Regions (in ranked order).
- The extension activities undertaken in support of the Agreement have consisted mostly of disseminating information about the program, providing assistance with applications, and responding to general queries about the Agreement programs. These activities have been supported by a number of projects funded under the human resources element of Program 4 which have assisted in upgrading the skills and knowledge of the regional staff with respect to livestock feed extension activities.
- Delivery of the Agreement functioned efficiently and effectively and was rated positively by key informants and farmers alike.

6.8 Recommendations

1) Create a more active role for the management committee in implementing and monitoring the Agreement

The management committee was not as active as it could have been in using its authority to develop the industry. In a future agreement, the management committee will need to play a more active role. This should include quarterly meetings to update progress and provide quarterly reports, disseminating results and/or any modifications in the thrust of the agreement, and ensuring that objectives and thrust of the agreement are understood at all levels. This recommendation should be accompanied by the appointment of an Agreement Manager.

2) Appoint an Agreement Manager

The basic approach to programming for any future Agreement will need to be more pro-active. There will need to be a common vision as to the objectives to be achieved, and a specific plan for meeting the established targets. This will require that a manager be appointed for the Agreement with the responsibility for ensuring that targets are met. The manager should work under the direction of the Management Committee.

3) Improve Data Collection and Reporting

The next Agreement will need to be much more targeted than the present one has been. Good data is essential to effective execution of the strategy. A major problem with the current Agreement is that there simply is not the reliable data available to make informed opinions, set objectives or take action. A very good case in point is the information on acreage by crop type. Although the Agreement's objectives were built around some very specific expectations for increases in acreage, the LFI database is not able to track how much the land base changed during the Agreement, and the consultants have been obliged to rely on opinions. This could have been avoided if a proper system of data collection had been established from the outset.

Some specific suggestions for improving the value and timeliness of the data are provided below:

- Make it a condition of participation in the Agreement (current and future) that registered clients report production data for each and every year after they are registered, regardless of whether or not they receive funding. (Future eligibility to be contingent upon regular yearly reporting.) This will provide consistency in reporting so that the progress of groups of clients can be accurately tracked over time and the "drop out" effect associated with the current reporting system minimized.
- Implement a "representative" sampling procedure that allows for a verification of both production area (hectares) and production volume (tonnes) for the grain and the forage sides of the Agreement. Currently, the only reporting that is verified is that for which there is a payment associated (i.e., for grain, incremental production volume is verified, for forage, incremental production area is verified). Forage production volumes are not currently being collected, and grain production area is collected, but is felt to be somewhat "soft" data. All of this data needs to be collected and verified so that accurate grain and forage yields can be calculated.
- A clear policy needs to be developed for handling appeals. After final decision of the appeal, adjustments to the database need to be made accordingly. This was the source of many of the reporting errors. In a number of instances, the database was not adjusted to reflect the settlement. Furthermore, claims that were settled and then paid was recorded in the year paid rather than actual growing year. For accurate reporting, the adjustments need to be for the associated growing year.
- Upgrade the current system with a more powerful and better suited software package (e.g., new version Ingres). The current system uses an old version Ingres

software package which is neither conducive to efficient nor timely manipulation, compiling and reporting of data.

- Develop closer liaisons between the data specialists of the major users and generators of industry data on the local livestock feed sector: the New Brunswick Department of Agriculture; Statistics Canada Crop Reporting; and the New Brunswick Grain Commission. This will facilitate more consistent collection and reporting of data from all three sources and generally improve the quality of the industry data available.
- Allocate the necessary resources to establish reliable baselines against which to measure progress. We have found that most baseline data either does not exist or is inaccurate. Baseline data is critical to measuring the success of the Agreement and to establishing reasonable target objectives. In conjunction with this, annual targets should be set so that interim progress can be determined.

7 Summary

The Agreement was effective in achieving improved feeding and storage practices, thereby increasing the profitability of the livestock industry. It has also had a very positive effect on attitudes toward legume forages and on the acceptability of local grain. It was also an agreement which was very positively received by the producers for its ease of access and responsiveness with a minimum of red tape.

Where there has been less success is in increasing, to any significant degree, the province's self sufficiency level. This was primarily because there was no development of the grain industry over the life of the Agreement. Future progress on self sufficiency will require a new approach to the grain industry and finding better ways to encourage production, including some form of a stabilization program.

The next agreement, if there is to be one, will need to better articulate the strategy which will be implemented and clearly link the strategy to the targets and objectives. It will also require a leader responsible for meeting the goals and targeting the resources of the Departments to help achieve this.

The Province has started down a path toward greater self-sufficiency and the livestock industry has clearly benefitted from these efforts. All indications are that more remains to be done, but that the Agreement has contributed significantly in making the changes needed to position the province to be more competitive in the next century.

Appendix A
List of Key Informants Interviewed

List of
Key Informants Interviewed

Government

Dwight Balzer, District Agrologist (Moncton)
Claude Bertheleme, Crop Specialist, NBDA
Phil Parlee, Farm Management Specialist, NBDA
Ernie Eagles, District Agrologist (Sussex), NBDA
Peter Schousboe, Director of Planning and Development, NBDA
Gilbert Ouellette, Assistant Deputy Minister, NBDA
Frank Cotter, District Agrologist, NBDA
Murray Snodden, Livestock Nutritionist, NBDA
Gary Cole, Manager, Development and Analysis, Agriculture Canada
Jerome Damboise, Program officer, Agriculture Canada
Paul Jensen, Dairy Specialist, NBDA
Vernon Taylor, Regional Director, NBDA
Walter Brown, Crop Specialist, NBDA
Dave Walker, Cereal Specialist, NBDA
Lionel Arseneault, Regional Director, NBDA
Hubert Cyr, District Agrologist, NBDA
Bill Lunnie, Dairy Specialist, NBDA
Roger Theriault, Crop Specialist, NBDA
Louis Philippe Albert, NB Regional Director, Agriculture Canada
Clinton McLean, Forage Specialist, NBDA
Peter Scott, Field Crop Specialist, NBDA
Ian McMillan, Red Meat Industry officer, Dept. of Commerce and Technology
Renald Cormier, Implementation Directorate, Agriculture Canada
Ted Pratt, Director, Plant Industry Branch, NBDA
Dick Russel, Supervisor, Agricultural Laboratory, NBDA

Industry

Barry Russell, ADLIC
Rod Archibald, NB Federation
Bill Sherwood, NBMMB
Al Toner, Florenceville Grain
Burt Kelly, Shur Gain
Winston Johnson, Soil and Crop
Paul Smith, Director, NB Grain Commission
Bill West, Agriculture Consultant
John Eaton, Co-Op Atlantic
Keith Russell, Atlantic Farmers Council
George Trueman, NB Grain Commission
Dino Kubik, NB Chicken Board

Appendix B
Framework for the Development
Of a Livestock Feed Self-Sufficiency Model

Based on estimated Statistics Canada figures, 1989-90 saw New Brunswick import an estimated 130,000 T of feed grains through FFA and production totalled around 59,000 T for a total of 189,000 T of feed of which 68.8% was imported. This is an approximation of our dependency on imported feed grains, however, the goal of LFDSA is to reduce such requirements. In this regard there are two options:

- we could reduce our livestock population to current levels of domestic production or
- we could increase feed production to accommodate the desired levels of feed inventories.

The latter was the decision made in the early 1980's and, therefore, one of the reasons for LFDSA.

It is safe to say that the poultry and hog industries are the greatest consumers of grains, beef the least, and that the dairy industry is somewhat influenced by forage production and quality. Raising the quality and quantity of forages through the utilization of legumes should reduce the industry's need for grain. The most important unknown factor is what percentage each commodity group utilizes of the total grain available. Once this is determined it will be possible to work on the industry's strong points and eliminate the grain requirements that are easily replaced by domestic production.

Looking at our imports for 1989/90 it is worth mentioning that roughly 43% was corn which at this point is something that New Brunswick is still developing with newer varieties, better production techniques, etc. Because of these agronomic factors, it is not a grain that is easily replaceable from current production. Therefore, if a substitute grain at a competitive price is not available then this will restrict the possibility, in the short run, of achieving total feed self-sufficiency.

To determine the current level of sufficiency, the 1986 level, and a plan for the future, we suggest the following format be used (Table 1).

Table 1 - Current Self-Sufficiency Status

Grain Type	Column A	Column B	Column C	Column D	Column E	Column F
Wheat						
Barley						
Oats						
Corn						
Total						

Column A - Eastern Canada Assisted Grains by Province of Production and Province of Consumption

Column B - Total Grain Production for New Brunswick (Statistics Canada and Alfie)

Column C - On-farm Consumption (Table A - Table B)

Column D - Feed Freight Assisted Shipments by Province of Destination

Column E - Total Grains Consumed* (Tables A + C + D)

Column F - Level of Self Sufficiency (Column D as % of E)

* Assumes limited/nil local exports

It has been suggested by mill operators that once the information in Column E was available, they could estimate the percentage of grains used for each industry (Table 2). The provincial livestock nutritionalist, feels that such an estimate would be close to reality. This now provides a close approximation of the specific grains used in each industry and the level of dependency on imported grain. We now can make a reasonable judgement of the current level of sufficiency and also forecast what level of self-sufficiency is reasonable, given the make-up of our livestock sector and current grain market conditions.

Table 2 - Consumption by Industry Sector

Grain Type	Column E (Above)	Dairy (%) T	Hogs (%) T	Poultry (%) T	Beef (%) T	
Wheat						
Barley						
Oats						
Corn						
Total						

The next step is to compare the grain usage in each livestock sector to imports and determine where the most significant gains can be made. It needs to be stressed that the objective in this exercise is to better understand self sufficiency from a user's stand point and then design programs which will assist in meeting their needs.

The strategy for producing this grain then needs to be developed. This will determine the basic form of the next agreement, addressing components such as:

- Which producers should be relied on (existing grain growers, potato producers, new entrants, etc. and in what proportions)
- What is the current harvesting and storage capacity, and how much more will be needed, and how much funding will this take?
- Where are the future acres available to develop for grain?

It seems clear that the key focus of the next Agreement will need to be on grain. The other components are important, but the results of the evaluation show that attitudes have changed and farmers will probably continue to make the improvements without a lot of effort on the part of the Agreement implementers. Grain, on the other hand, will require a lot more work.

Appendix C
Detailed Summary of
Participation Indicators

TABLE 1
PROFILE OF FARM SURVEY PARTICIPANTS
BY REGION AND PRIMARY SOURCE OF INCOME

	NE	NW	W	C	S	SE	E	Total	% of Sample	Actual % LFI DB
Dairy	3	5	5	9	19	11	2	54	36.7%	41.8%
Beef	1	0	10	2	6	11	2	32	21.8%	23.5%
Potatoes	2	14	23	1	2	0	0	42	28.6%	22.1%
Grain	1	2	3	0	0	1	0	7	4.7%	4.0%
Forage	1	0	0	0	0	0	1	2	1.4%	1.3%
Sheep	0	0	1	1	0	1	0	3	2.0%	1.8%
Vegetables	0	0	0	0	0	1	1	2	1.4%	9%
Poultry	0	0		0	0	1	1	2	1.4%	2.0%
Hogs	0	0	0	0	1	2	0	3	2.0%	2.6%
Sample Total	8	21	42	13	28	28	7	147	100.0%	100.0%
% of Sample	5.5%	14.3%	28.6%	8.8%	19.0%	19.0%	4.8%	100%		
Actual % LFI DB	4.5%	14.4%	30.7%	9.8%	19.0%	18.6%	3.0%	100%		

TABLE 2
REGIONAL PROGRAM 1 PAYMENTS TO FARMERS BY PRIMARY INCOME SOURCE
AS AT AUGUST 20, 1990

Farm Type	Northeast	Northwest	Western	Central	Southern	Southeast	Eastern	Totals	% Total
Dairy	\$39,320	\$213,807	\$287,318	\$169,827	\$451,383	\$243,189	\$18,286	\$1,423,130	43.5%
Potatoes	16,320	368,683	660,764	822				1,046,589	32.0%
Forages	762		405			7,458	1,115	9,740	0.3%
Sheep		757	6,171	1,092		16,273	48	24,341	0.7%
Grain	780	101,691	68,832	171		35,924		207,398	6.3%
Poultry			25,191		1,681	2,946	600	30,418	0.9%
Vegetables					12,236	1,026	1,149	14,411	0.4%
Hogs		632	56,133	27,797	15,582	16,196		116,340	3.6%
Beef	1,183	37,435	111,470	11,578	52,611	95,135	7,065	316,477	9.7%
Fruit				784				784	
Other	6,079	26,736	3,918			1,000		37,733	1.2%
Unknown	4,276	31,831			7,406	3,971		47,484	1.4%
Totals	\$68,720	\$781,572	\$1,220,202	\$212,071	\$540,899	\$423,118	\$28,263	\$3,274,845	100.0%
% Total	2.0%	23.9%	37.3%	6.5%	16.5%	12.9%	0.9%	100%	

TABLE 3
REGIONAL PAYMENTS TO FARMERS BY PRIMARY INCOME SOURCE
TOTAL FOR PROGRAMS 2, 3 AND 4
AS AT AUGUST 20, 1990

Farm Type	Northeast	Northwest	Western	Central	Southern	Southeast	Eastern	Totals	% Total
Dairy	\$27,305	\$ 86,428	\$149,374	\$129,119	\$304,177	\$306,387	\$26,058	\$1,019,848	48.5%
Potatoes		212,806	246,620	822				459,426	21.8%
Forage			405			2,000		2,000	0.1%
Sheep	1,000	827	1,000	1,092		1,958		4,785	0.2%
Grain		210,608	26,690	171		31,123		268,421	12.8%
Poultry			7,827					7,827	0.3%
Vegetables					4,870			4,870	0.2%
Hogs		4,502	12,452	13,008	2,689	3,956		36,607	1.7%
Beef		6,312	35,993		24,276	26,170	17,725	110,476	5.4%
Other	42,196	493							
Unknown	35,000	47,789	20,000	14,957			28,500	146,246	7.0%
Totals	\$105,501	\$569,765	\$490,956	\$157,084	\$336,012	\$371,594	\$72,283	\$2,103,195	100.0%
% Total	5.0%	27.1%	23.3%	7.5%	16.0%	17.7%	3.4%	100%	

NB: This represents LFDS/A's most accurate data on payments to farmers only for Programs 2, 3 and 4. Some non-farmer payments may be included in figures due to inputting anomalies. However, to the extent possible, these payments have been extracted.

Table 4
Summary of Calculations for
Sector Penetration Rates

Primary Income Group	(A) No. of LFI Participants	(B) No. of N.B. Farmers	(A) - (B) Penetration Rate
Dairy	295	631	47%
Potato/Forage*	165	384	43%
Grains	28	103	27%
Beef	166	739	22%
Hogs/Pigs	19	125	15%
Poultry	14	96	15%
Vegetables	6	92	7%
Totals	704	2,170	32%

Sources: LFDSA Database

Statistics Canada 1986 Census on New Brunswick Agriculture